

THE IRON AGE

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Ad. on Page 16.

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49 CLIFF ST., NEW YORK.

THE IRON AGE

New York, Thursday, August 8, 1907.

The Philadelphia Thread Milling Attachment.

The device illustrated when applied to any standard engine lathe renders the latter capable of performing thread milling operations with as great facility as a machine specially designed for that purpose. Barwood & Snider, the Bourse, Philadelphia, are the sales agents

able bracket attached to the head of the lathe as shown in Figs. 3 and 6.

With the lathe back gears thrown out and the cone pulley disengaged from the large gear on the spindle, the drive for the attachment is available. The drive for rotating the work is obtained from the main driving shaft of the attachment through a worm and worm wheel, as indicated at *a* in Fig. 7, and thence through a pair of bevel gears, *b*, to a geared face plate, *c*, which is

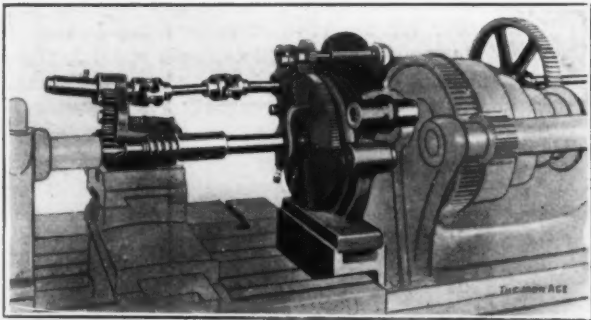


Fig. 1.—Rear View Without the Relieving Device.

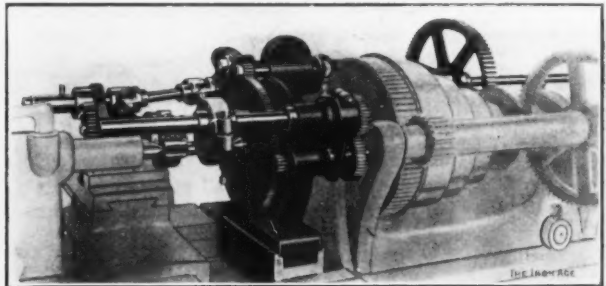


Fig. 4.—Rear View with the Relieving Device.

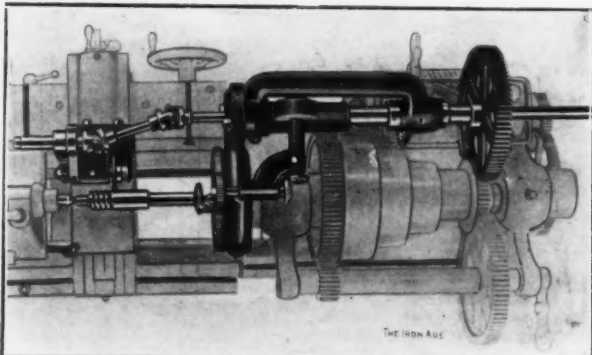


Fig. 2.—Top View Without the Relieving Device.

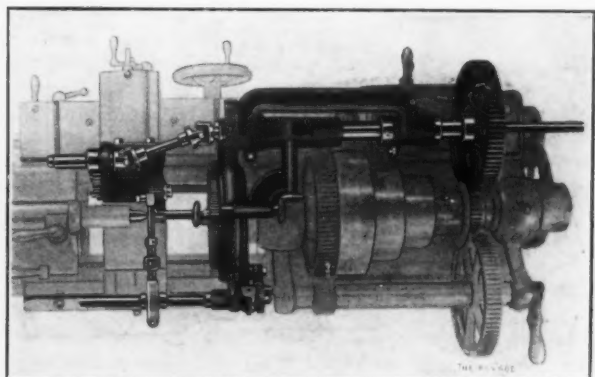


Fig. 5.—Top View with the Relieving Device.

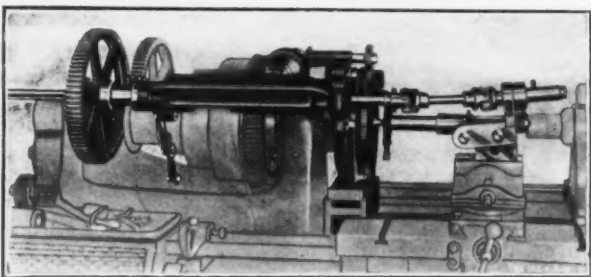


Fig. 3.—Front View Without the Relieving Device.

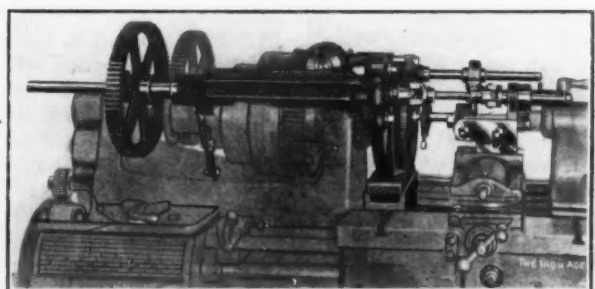


Fig. 6.—Front View with the Relieving Device.

THE PHILADELPHIA THREAD MILLING ATTACHMENT FOR LATHES.

for the attachment. It is simple in design and complete in itself, and is attached to the lathe in much the same manner as the lathe steady rest and in about the same time. Figs. 1, 2, 3 and 7 show various views of the plain attachment, and Figs. 4, 5 and 6 the same with the addition of a relieving device. The hood casting, as shown in the engravings, is clamped securely to the ways of the lathe by a bolt and clamp cross tree. The arm casting, forming the bearing for the telescoping driving shaft and carrying the main driving gear which meshes into the small pinion on the lathe cone is connected to the hood casting and is adjustable for the proper engagement of the gears. This arm is further supported by an adjust-

threaded to fit the nose of the lathe spindle. Changes in the rotative speed of the work are made by using small pinions of different sizes at *d* to mesh into the geared face plate.

The cutter head is clamped in the T-slot of the carriage rest in the place of the tool post, and is adjustable to any angle for various thread pitches, either right or left hand; the center line of the cutter is always on a level with the center line of the work. The drive to the cutter head is taken from the attachment's main driving shaft through two universal joints *e* and *f*, Fig. 7, thus allowing for the swiveling of the cutter head to the angle required by the pitch of the thread, as well as for va-

rious diameters of work and cutter. The cutter arbor *g* has a long bearing in the cutter head, insuring rigidity, and is revolved by a train of spur gears from the shaft *h*, which is driven through the universal joints, and also has a long bearing in the cutter head. The main driving shaft telescopes in the arm, and is feathered to the quill carrying the large driving gear *i*, thus allowing for the drive of the cutter during the travel of the lathe carriage. Extra lengths of driving shaft for lathes having long carriage travel are furnished at an additional cost. The main driving shaft has a female threaded end to receive these lengths, and each length has a male and female threaded end. The correct depth of thread is gauged by the micrometer graduations on the cross feed screw of the lathe carriage.

Any pitch thread may be cut with the thread milling attachment that may be cut on the lathe, either through the changing of gears on the quadrant, or the quick change gear device, if it is one of the more modern lathes. The accuracy of the lathe and its lead screw determine the accuracy of the work produced, and as there is very small error in the standard lathes of to-day the attachment is able to produce work accurate within a commercial limit of error and very economically.

Thread milling cutters are supplied of various shapes according to the thread desired. These are of larger diameter than are ordinarily used for thread milling, but cutters of smaller diameter are furnished for cut-

milling attachments are made perfectly interchangeable and the relieving attachment parts can be obtained later and be applied in a few minutes' time. With the relieving attachment it is possible to mill and relieve taps, either standard or special, at one operation. Gang cutters can be furnished for ordinary tap length of thread, whereby the entire thread may be milled and relieved in one revolution of the work.

The Philadelphia thread milling attachments may be applied to any standard make engine lathe from 18-in. swing up, having the screw cutting feature.

Another new Carrie blast furnace of the Carnegie Steel Company, at Rankin Station, Pittsburgh, was blown in last week, making a total of seven furnaces at that plant. At the present time the Carnegie Steel Company is operating 52 of its 55 blast furnaces, and now has four furnaces under erection, two of these being located at Duquesne, Pa., one of which will be ready about January 1, and the other about April 1, 1908, and two at Youngstown, which are expected to be ready for operation in February or March of next year.

The Shenango Furnace Company, Frick Building, Pittsburgh, is rushing work on its new blast furnace at Sharpville, Pa., which is expected to be ready for operation in September or October. As soon as this stack is

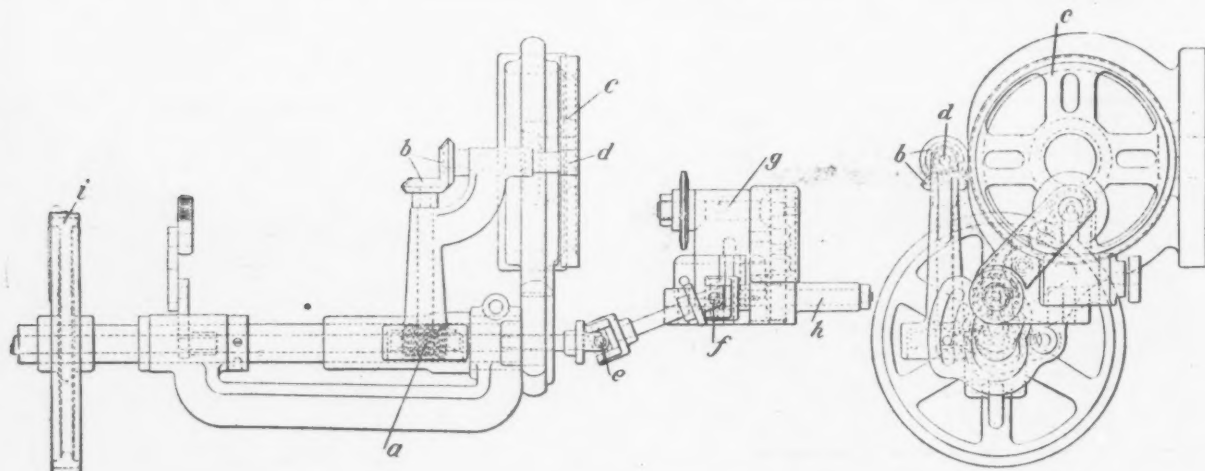


Fig. 7.—Plan and End Elevation of the Philadelphia Thread Milling Attachment Without the Relieving Device.

ting close to shoulders. The cutters may be had of carbon or high speed steel. The cutter speeds and the rate of carriage travel depend upon the speeds of the belt-driven cone pulley on the lathe; thus the number of steps on this pulley determine the number of changes of feed and speed, and these have been found sufficient for the ordinary run of work. Multiple threads are cut either by using a single or gang cutter on the cutter arbor, the proper lead being obtained through the lathe change gears. Taper threads may be cut with the thread milling attachment when the lathe is equipped with a taper attachment.

The relieving attachment is supplied when ordered as a part of the thread milling attachment. As shown in Figs. 4 and 5, the relieving device is attached to the hood casting and is driven by a pinion from the geared face plate through a train of spur gears. The shaft of the relieving device carries an eccentric. The cutter arbor bearing is placed in an eccentric bushing in the cutter head with a rocker arm extending upward. This rocker arm is connected by an adjustable connecting rod with the driving eccentric. By a proper combination of gears in the drive of the relieving device it is possible to get any number of reliefs to a revolution of the work necessary in the making of standard or special taps. The throw of the eccentric is adjustable to give the required amount of relief. This relieving attachment may be ordered with the attachment or supplied at any time, providing at the time of the order it is mentioned that a relieving attachment might be ordered later. The thread

finished the company will start work on another one, these two furnaces to replace two present stacks which will be dismantled when the new furnaces are completed.

Kentucky, with a population of 55 to each square mile, has but 8 1-10 miles of railroad line for each 100 square miles, and but 14.5 miles for each 10,000 inhabitants. Indiana, just across the river, with a population of 76 for each square mile, has 19.2 miles of railroad line for each 100 square miles.

Judge Kenesaw M. Landis of the United States District Court, Chicago, on August 3 fined the Standard Oil Company of Indiana \$20,240,000, the extreme limit of the penalty fixed for accepting secret freight rates. This is the largest fine imposed by a court in the history of jurisprudence.

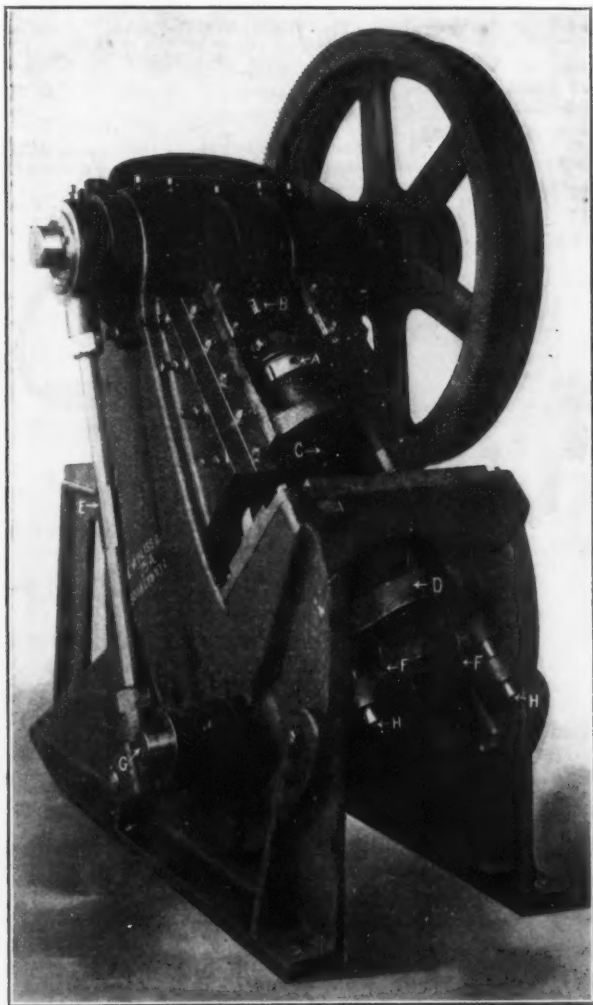
Furnace D, under erection by the National Tube Company, at McKeesport, Pa., is nearly completed, and is expected to be ready for blast early in September. This company has three furnaces at McKeesport now in operation and turning out close to 40,000 tons of pig iron per month.

J. B. Hogg, civil and mining engineer, Connellsville, Pa., has recently published a very complete map showing railroads and their connections in the Connellsville coke region.

A Bliss Armature Cutting Press.

Competition in the manufacture of motors and dynamos and the quantities of disks necessary for their armatures have been the means of bringing about many improvements in the machinery used in forming the disks. The armature disks for the standard types of motors are cut complete with notches and center hole, for it is essential that the disks of the sizes made in large quantities be produced in the most economical manner and with a minimum of handling. The press illustrated was specially built for this class of work by the E. W. Bliss Company, 11 Adams street, Brooklyn, N. Y.

The machine is designed along new lines, and embodies several interesting features. One of these is the elimination of springs used as knockouts, because they are not positive and absorb an unnecessary amount of power. This machine is fitted with positive knockouts



A Press for Stamping Armature Disks Complete at One Stroke,
Built by the E. W. Bliss Company, Brooklyn, N. Y.

for both die and punch, which insures the ejection of the disk and scrap, and uses less power to accomplish it. Another important feature is that the slides are extra long, and, being accurately fitted, they perfectly guide the delicate dies operated in the ram. The latter is connected with the operating shaft by two slide pitmans, which evenly distribute the pressure.

To accommodate different lengths of dies, there is a special screw adjustment in the mandrel, indicated at A in the engraving. The upper knockout B is stationary, and is between the two pitmans. It acts positively against the knockout plate in the mandrel, which in turn acts against knockout pins in the punch projecting them through the holes C in the mandrel, as the dies recede after making a stroke. This knockout has screw adjustment to compensate for any adjustment that may be made in the mandrel. The lower knockout D is actuated by an eccentric on the main shaft, which operates the knockout levers through the medium of a long connecting

rod E, which being adjustable in length also serves to adjust the knockout plate. The knockout levers F are rocker arms on the lower shaft G, and raise the knockout plate on the upstroke of the slide sufficient to eject the blank from the die. The plate is accurately guided by two rods, which keep it parallel with the die in the bed, insuring a uniform pressure on the knockout pins in the lower die.

The inclined position of the press allows the disk after being ejected from the lower die to fall out through the opening at the back of the press, while the upper knockout strips the scrap from the punch and enables the operator to rapidly feed another blank.

The machine is adapted for cutting disks complete with outside notches, center hole and key slot, up to 10½ in. in diameter, or plain disks with center hole up to 12 in. in metal up to No. 23 Stubs' gauge. The press weighs about 5000 lb., and is direct driven by a 3-hp. electric motor fitted on a table at the back of the press. A pinion on the motor meshes a gear cut in the face of the flywheel. The gear has a pitch diameter of 51 in. and a 3-in. face; the remainder of the flywheel is 50 in. in diameter by 4-in. face. The motor runs at 1200 rev. per min., and the gear reduction being 17 to 1, the crank shaft makes 70 turns a minute. The floor space occupied is about 73 x 55 in., and the height from the floor to the center of the crank shaft is about 60 in.

Railroad Apprentice Schools.

The apprentice school of mechanics of the New York Central Railroad at Indianapolis, Ind., has just closed its first year. The company has nine such schools along its system, the others being at Collinwood, Depew, Elkhart, East Buffalo, Jackson, McKees Rocks, Oswego and West Albany. The list of trades taught comprises machinist, boilermaker, blacksmith, tin and copper worker, patternmaker, molder, carmaker, carpenter and cabinetmaker. The pupils are paid 10 cents an hour the first year, 12 cents the first half of the second year, 14 cents for the last half, 16 cents for the first half of the third year, 18 cents for the last half, and 20 cents for the fourth and last year.

The schools are operated for 10½ months each year, 2 hr. each day, three days in the week. A diploma is given each apprentice who completes the course, and his wages thereafter is to be 32 cents an hour. The nine schools during the year past had over 400 pupils, and the wages paid, not including the cost of instruction, amounted to \$17,000. The Indianapolis class numbered 45. The new school term begins September 3. Practically the same system of teaching is used at all the schools. Lessons are mapped out and sent to each. C. W. Cross, superintendent of apprentices for the New York Central, gives his whole time to the schools. His early experience was on the Pennsylvania Lines west of Pittsburgh, after which he was master mechanic of the Lake Shore & Michigan Southern. Other railroads, it is said, have begun to try the apprentice school plan of getting a future supply of skilled mechanics.

At the fourth annual meeting of the Alliance of German societies of Indiana at Indianapolis, August 3, Frederick Francke, president of the Francke Hardware Company, of that city, was appointed chairman of a committee to take up with the officials of the larger cities of the State the establishment in each of free employment bureaus, under the direct supervision of city officials. The plan is not only to supply a place free of cost where the unemployed may seek work, but also to compel those who do not go voluntarily to report daily. It is claimed that this will tend to lessen the number of inmates of workhouses and jails, and thus pay for the maintenance of the employment agency.

Capt. W. C. Richardson, Cleveland, Ohio, has placed an order with the American Shipbuilding Company for a 9000-ton lake freighter for 1908 delivery. The boat will be 500 ft. over all. It will be built at the Cleveland yard of the shipbuilding company.

The Lash Steel Process.

The Lash Steel Process Company, Cleveland, Ohio, and the Canadian Lash Steel Process Company, Ltd., Toronto, Canada, are two new companies which have been incorporated for the purpose of promoting and developing a new steel making process invented by Horace W. Lash, vice-president of the Garrett-Cromwell Engineering Company, Cleveland, Ohio. Mr. Lash states that with the aid of this process he has succeeded in making a good grade of open hearth steel from a mixture of one-third pig iron and two-thirds iron ore. The ore receives special treatment before using, and then is charged mixed with the pig iron in the usual way, the reduction taking place during the melting, and in this way the entire iron content of the ore, as well as the pig iron, is converted into steel.

The preliminary treatment of the ore is very simple as well as inexpensive, the principal expense being in the crushing, as it is necessary to have the ore in a finely divided condition, and for this reason magnetic concentrates have been used largely in the preliminary trials, although some heats have been made from Lake Superior ores. The process is, however, well adapted to the use of magnetic concentrates, such as produced from the sand ores found on the shores of the St. Lawrence River or on the Pacific Coast, or the magnetic ore mines of northern New York and Canada.

Trials have been made in both the electric furnace and the regular open hearth furnace. The electric trials were made at Niagara Falls under the supervision of Fitzgerald & Bennie. In this case the furnace charges were made up of one-quarter pig iron and three-quarters iron ore. The average yield from the metallic content charged was about 98 per cent.

In the open hearth furnace, where heats from 10 to 15 tons have been made, the yield averaged about 96 per cent. of the metallic matter charged. The trials in the open hearth furnace, which are still under way at the plant of the Carbon Steel Company, Pittsburgh, Pa., have proved to be most satisfactory, and it is now predicted that within the next few months the new companies will be able to show conclusively that open hearth steel can be produced by this method for several dollars per ton less than it can be by the present method of using pig iron or pig iron and scrap.

One of the striking novelties of the process is that the pig iron is used in a finely divided or shotted condition, and in this way the metalloids contained in the iron, aided with a small quantity of free carbon added in the form of coke dust, aid greatly in the reduction of the iron ore.

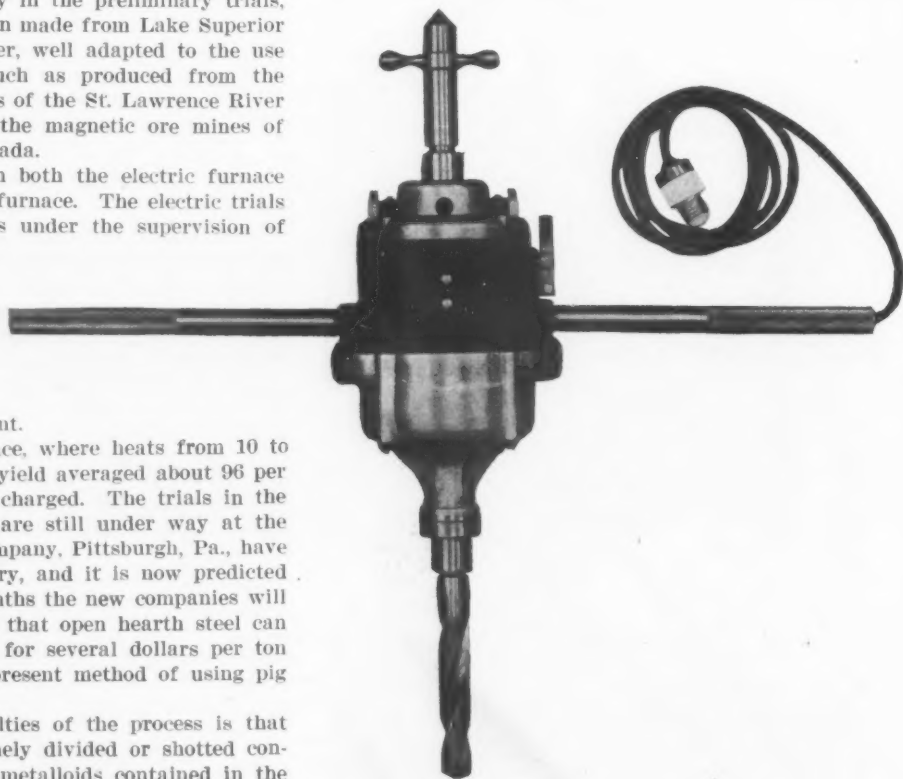
The general office of both companies will be located in the White Building, Buffalo, N. Y., in charge of Seward Babbitt, who has been made secretary and general manager of both companies, from which point a very active campaign will be conducted in the prompt development of the process, both in this country and Canada. Arrangements are being made to test the new steel making process in the Héroult electric furnace in Germany and in the Stassano electric furnace in Italy. Preparations are also being made for tests on the Canadian side of Niagara Falls, using Canadian magnetic concentrates.

The report of the Minister of Mines of British Columbia for the year ending December 31, 1906, showed that the mineral production of the province for that year, chiefly gold, silver, lead, copper and coal, amounted to \$24,980,546, against \$22,461,325 in 1905. Concerning iron ore, the report contains this brief reference to the possibilities of the west coast of Vancouver Island: "The hematite iron ore deposit, noted in the 1903 report as situated on the west arm of Quatsino Sound, has been further prospected by small open cuts and test pits, with results that appear satisfactory to the owners. It is understood

that the property has been under bond to a syndicate which contemplates the making of iron at Irondale, Wash., but, as far as can be learned, no ore has been mined or shipped from the property."

The Hisey Portable Electric Screw-Feed Drill.

The accompanying illustration shows a new type electric drill, made by the Hisey-Wolf Machine Company, Cincinnati, Ohio, and just being placed on the market. It is made in two sizes, one capable of driving a $\frac{7}{8}$ -in. drill and weighing 27 lb. and the other having a $1\frac{1}{4}$ -in. drilling capacity and weighing 38 lb. The capacities given are for drilling steel; holes of larger size can be drilled in softer material. The driving power is obtained by connecting to an ordinary incandescent lamp socket. The motor is fully inclosed at the spindle end, preventing borings or chips from entering in any way. The switch is located on the motor within convenient reach of the operator. The two side handles are detach-



A New Portable Electric Drill Made by the Hisey-Wolf Machine Company, Cincinnati, Ohio.

able. An "old man" is furnished as an extra, if desired.

The gears and working parts are hardened. All parts are easily accessible for adjustment, but are at the same time protected from injury. This drill is claimed to be simple, durable and compact, and to have no complicated parts likely to get out of order. It is especially built for the heavy work indicated by the drilling capacities mentioned. These electric drills are particularly intended for machine shops, boiler plants and ship yards and in bridge building and general construction work. They can be carried and used at any point to which a lamp cord can be extended.

Hand drills in smaller capacities and Scotch drills up to 2-in. capacities are also made by the company.

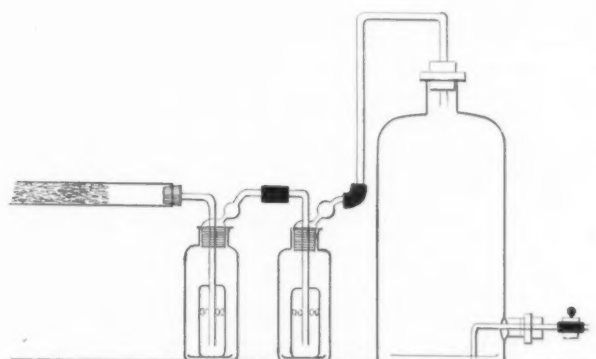
The new Government dry dock just completed at League Island Navy Yard, near Philadelphia, is the largest concrete basin of its kind in the country. It is 754 ft. long inside the coping, 140 ft. wide, and has a depth over the sill at high tide of 30 ft. It has been seven years in building and cost \$5,000,000. The Kearsarge, weighing 11,000 tons, will be the first vessel to be put in the dock.

Testing Producer Gas for Sulphur.

BY RANDOLPH BOLLING.*

Gas producer tests should include determining the total sulphur in the gases. It occurs in several chemical combinations with carbon, but mainly as hydrogen sulphide and carbon disulphide. The precise state of combination is immaterial, as sulphur in any form is undesirable, therefore knowing the total sulphur in a certain volume of gas at a certain temperature is sufficient to compare different coals. Methods like Bunte's,† in which the gases are led into a 100-c. cm. burette, and a standard solution of iodine is introduced until no longer decolorized ($\text{H}_2\text{S} + \text{I}_2 = \text{S} + 2\text{HI}$) would, of course, be useful when working on illuminating gas which has been purified, but producer gas is unpurified at most open hearth steel plants, and contains sulphur in other than simple combinations like hydrogen sulphide, which this method would fail to detect.

Another very excellent method which will give accurate results on any kind of combustible gas is the Drehschmidt method. This makes use of a Bunsen burner, so arranged that all the sulphur compounds are burned to sulphur dioxide and sulphuric acid in passing through the intensely hot flame. It appears to be used quite extensively in illuminating gas work, but it has the disad-



Apparatus for Collecting a Sample of Producer Gas to Be Tested by the Bolling Method.

vantage of employing quite elaborate and expensive apparatus—a gas meter, special purified air supply and base for the lamp and a train of absorption bottles containing a 5 per cent. solution of potassium carbonate with a little bromine and a water aspirator furnishing suction. Very careful regulation of the air supply is required to keep the flame at the proper height, and it is likely to go out in the middle of a run. The equipment is not easily portable, and the gas must be piped to it from the producers. The method that the author devised and is using overcomes the trouble with the Bunte process and avoids the complicated appliances used with the Drehschmidt method.

The Bolling Method.

The apparatus required is one five-liter aspirator bottle, one centigrade thermometer, one barometer and two Allihn's gas washing bottles of about 500 c. cm. capacity. The absorbing bottles, containing about 200 c. cm. of bromine water each and 25 c. cm. of hydrochloric acid saturated with bromine are connected by rubber tubing with each other and the upper opening of the aspirator bottle, which is completely filled with water. The lower outlet is a short piece of glass tubing thrust through a rubber stopper and terminating in a rubber tube with a pinch cock.

The apparatus, assembled as shown in the diagram, is taken to the producers and connected with the gas main by a short length of pipe packed with loose asbestos fibres. The pinch cock is opened, and the gas slowly aspirated through the bromine in the absorbing bottles. The temperature of the gas passing through the absorb-

ing solution is taken with a thermometer inserted through the stopper of one of the bottles. The apparatus is then taken back to the laboratory and the bottles are disconnected, and their contents transferred to a 750 c. cm. beaker, carefully washing out all of the bromine water with distilled water. The solution is now heated to boiling on a hot plate, and the heating continued until the bromine is evaporated, which is noted by the solution losing color. The sulphur is next precipitated by barium chloride, after carefully neutralizing with ammonia, the solution being boiled vigorously for at least 30 min. to throw down the barium sulphate in a form easily separable by filtration. This solution is then filtered through a Gooch crucible, the perforated bottom of which is fitted with an asbestos felt, previously ignited and weighed, and the barium sulphate washed free from salts by water, and the separated barium sulphate is heated to a dull red over a Bunsen burner, cooled and weighed.

The sulphur found is calculated for 100 c. m. of gas at 10 degrees C. and 760 mm. pressure. If t denoted the temperature of the gas, f the tension of the aqueous vapor at this temperature, b the barometric pressure and p the weight of the barium sulphate, then the amount of sulphur, s , in 100 c. m. of the gas is:

$$s = 200 \times p \times 0.13748 \times \frac{750.8}{283} \times \frac{273 + t}{b - f} = p \times 72.947 \times \frac{273 + t}{b - f}$$

Tables for the tension of aqueous vapor can be found in most handbooks on chemical physics.

Some of the results the author has obtained on a battery of 16 producers charged with Sydney coal are given in the following. The average proximate chemical analysis of the coal dried at 100 degrees C. was:

	Per cent
Moisture	3.42
Volatile and combustible matter.....	35.10
Fixed carbon.....	60.10
Ash	4.80
Total sulphur.....	1.91

The sulphur calculated for 100 c. m. of gas at 10 degrees C. and 760 mm. pressure and determined at short intervals during regular work was:

Test No.	Milligrams.	Test No.	Milligrams.
1.....	0.075	6.....	0.0767
2.....	0.0762	7.....	0.0765
3.....	0.0788	8.....	0.0762
5.....	0.0761	9.....	0.0764
		10.....	0.0760

The advantages of the gravimetric end of the method are apparent, especially when one is determining only minute traces of sulphur. Bromine as an absorbent is superior to most absorbing and oxydizing agents because it is volatile, and can easily be expelled from its combination with bases. It is especially recommended by some of the older workers, and Fresenius for breaking up complex forms of sulphur and carbon. By taking the gas direct into the absorbing solutions, there is no fear of losing any sulphur, as would be the case if the sample had been collected over water or mercury—if over the latter sulphide of mercury would form.

George E. Roberts, retiring Director of the Mint, has made an inquiry for the purpose of correcting errors in the Treasury estimates of the stock of gold coin in the United States. With proper allowances for losses to Canada, for industrial consumption of coin and for unrecorded exports, the total stock of gold coin, including bullion in the mints, is calculated at \$1,484,845,280 on June 1, 1907, and of this amount the Treasury and national banks held \$1,109,458,330. It is stated that in no other country can so large a percentage of the estimated stock of standard money be definitely located.

It is announced that the surveys for the proposed canal from Lake Erie to the Ohio River have been completed. Land for the right of way is now being acquired, and active digging on the waterway will, it is stated, begin early next spring. If the canal should be completed, for which its projectors allow six years, it will be possible for lake vessels to carry iron ore directly from Lake Superior to furnaces in the Pittsburgh District and to send coal from the western Pennsylvania mines to lake ports.

* Laboratory of the Nova Scotia Steel & Coal Company, Ltd., Sydney Mines, Nova Scotia, Canada.

† Bunte, *Journal für Gasbeleuchtung*, 1888, vol. 31, page 898.

The Wilson-Maeulin Recording Pyrometer.]

Following the introduction of its indicating pyrometer, the Wilson-Maeulin Company, 110 Liberty street, New York, has brought out a recording pyrometer adapted to the uses of works that have not heretofore been disposed to incur the expense of making complete records of temperatures in connection with their various operations. The indicating pyrometer of the same manufacturers is a combination of the thermo couple and milli-voltmeter. The recording pyrometer substitutes the recording apparatus shown in Fig. 1 for the indicator scale. The portion of the pyrometer which extends into the heated area

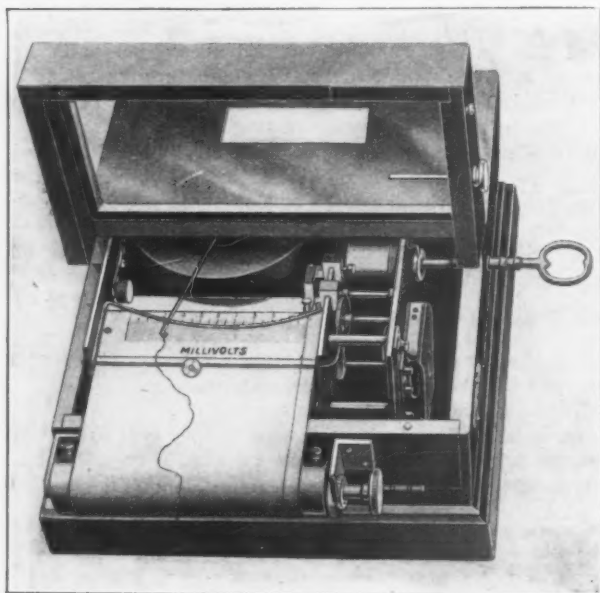


Fig. 1.—The Wilson-Maeulin Recording Pyrometer.

is called the fire rod. It is shown in cross sections in Fig. 2. At *a* is the thermo junction of an iron tube, *d*, and an alloy wire, *e*, the wire being surrounded by asbestos insulation, *k*. As the junction is heated a slight electric current is generated, and wires connecting the free ends of the pipe and of the alloy wire with the milli-voltmeter to which the recording apparatus is attached, permit of the measuring and recording of the current. A fraction of a volt increase in the current represents a certain number of degrees rise in temperature.

The recording pyrometer, while sensitive to changes in temperature, is of such construction that it does not require leveling or to be erected on a special foundation.



Fig. 2.—Longitudinal and Transverse Sections of the Fire Rod.

It is also simple in its movements. The record paper moves forward by tension across its entire width, without liability to tear or halt. The record is made with ink, the contact of pen and ink occurring every 15 seconds. Between the times of contact the needle is free to swing. The paper advances $2\frac{3}{4}$ in. an hour, and continuously run lasts a week, furnishing a "straight ahead" record.

A number of fire rods may be installed where temperatures at different furnaces are to be measured at intervals, and any one of the fire rods may be instantly connected with an indicator by means of a switch. It is stated that one indicating and one recording pyrometer will give a satisfactory working check on several furnaces, though where records of the temperature at which all product is made are desired a recorder for each of the furnaces simultaneously operated is necessary. The fire rod, as illustrated, is intended for temperatures up to 1800 degrees F. A modified form of the recorder is supplied for use with the manufacturer's platinum thermo couples, the recorder in such cases operating as high as 2900 degrees F.

Protecting a Secret Process.

In reversing the decree of the Court of Chancery of New Jersey, the Court of Errors and Appeals of that State has rendered a decision which is of great importance to those who are interested in the protection of secret manufacturing processes. In 1898 a number of men, some of whom were identified with the tin can industry, acquired in Holland a process for detinning tin plate scrap, recovering the tin, and making the scrap steel available for the manufacture of open hearth steel. They organized the Vulcan Detinning Company and built detinning plants at Sewaren, N. J., and Streator, Ill. The secret was intrusted to certain directors of the Vulcan Detinning Company, among whom was Franz A. Assman, chairman of the Executive Committee.

The American Can Company at first sold its scrap to the Vulcan Detinning Company. Subsequently, however, Mr. Assman became interested in the American Can Company and sold his stock in the Vulcan Company and resigned. He, together with three other employees, two of them former superintendents of the Vulcan Company, who had familiarized themselves thoroughly with the secret process, went over to the American Can Company, and after a demonstration had been made by those supposed to know the secret to the satisfaction of the American Can Company, that company built two plants, one in Paulsboro, N. J., and the other in Joliet, Ill.

The Vulcan Company then endeavored to enjoin the American Company. Testimony was taken in this country for 30 days, and also for two months in Holland and in Germany. The American Can Company first contended that it was no secret process, but finally alleged that it had purchased the right to use the process from its original inventor in Germany, from whom the American Can Company alleged the Vulcan people had obtained it through former employees of the German inventor.

Vice-Chancellor Bergen dismissed the bill on various grounds, and the matter was then taken by the Vulcan Company to the Court of Errors and Appeals, the highest court in the State, whose decision not only upset the former holding of the Vice-Chancellor, but decided in favor of the Vulcan Company. As a result the American Can Company was enjoined from using the process, and will be required to account to the Vulcan Company for all the profits that it has made from the time it began to use the secret process.

The court held that the employees and the chairman of the Executive Committee were trustees of this secret process, and held it for the sole benefit of the Vulcan Company; that the American Company, by acquiring it from the delinquent servants and officer, must be held likewise as trustees for the Vulcan Company, and that it did not avail the American Can Company to acquire the right to use the process from the alleged original inventor, if that was the fact, on the ground that if it did so, it would be required to hold that also merely as trustee for the Vulcan Company.

The case was then remanded to the Vice-Chancellor, who on July 31, in pursuance to the directions of the Court of Appeals, signed the decree enjoining the American Can Company from operating its detinning plants, which was done. Subsequently the American Can Company obtained a license from the Vulcan Detinning Company permitting it to run its two plants for six months on a royalty basis of a specified amount per ton.

The present digging equipment on the Panama Canal consists of 63 steam shovels, 32 of 95 tons, 28 of 70 tons and 3 of 45 tons each, while 15 further 95-ton and 7 45-ton steam shovels are to be delivered this year. There are also 184 locomotives in service, 228 steam or pneumatic drills and 73 machine or well drills. While there was a falling off in the rate of digging in May and June, due to the rainy season, it is expected that 1,000,000 cu. yd. a month will be reached later in the year. The total excavation necessary to dig the canal was figured at 111,280,000 cu. yd. To July the amount taken out was 8,651,802 cu. yd. At 1,000,000 cu. yd. a month the channeling would be completed in 1815.

A New Mason Pressure Controlling Device.

A new horizontal pressure controlling device in the three forms in which it is manufactured by the Mason Regulator Company, Boston, Mass., is shown in the accompanying illustrations. Its purpose is the controlling of power and electrically driven pumps of all types and all classes of service, including vacuum systems. It may be installed with various sizes of diaphragms for vacuums, low pressures, and pressures up to 400 lb., and with cup leather packed plungers for higher pressures up to 3000 lb.

The essential parts of the device common to all three types include a horizontal cylinder and piston controlled

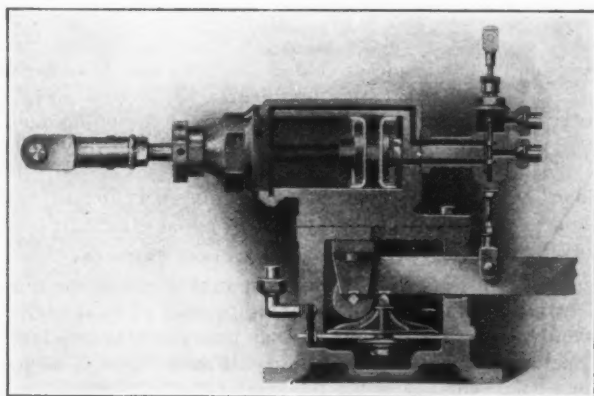


Fig. 1.—Section of the Pressure Controller Made by the Mason Regulator Company, Boston.

by a double acting pilot valve, which admits pressure and exhausts it from either side of the cylinder, and is actuated by a weighted lever suspended upon hardened steel knife edges. The lever acts on a rubber diaphragm the space beneath which communicates with the pressure or vacuum system to be governed. Water pressure, directed by the pilot valve, operates the piston and can be taken from any source giving a clean supply at sufficient pressure, which should not exceed 200 lb. per square inch, 100 lb. being preferable. Less pressure than that may be used if sufficient power is obtained for operating the mechanism. Either opening of the pilot valve may be used to admit the pressure, the other opening being used as an exhaust. Thus either direction of travel of the operating cylinder may be obtained. The piston is 3 in.

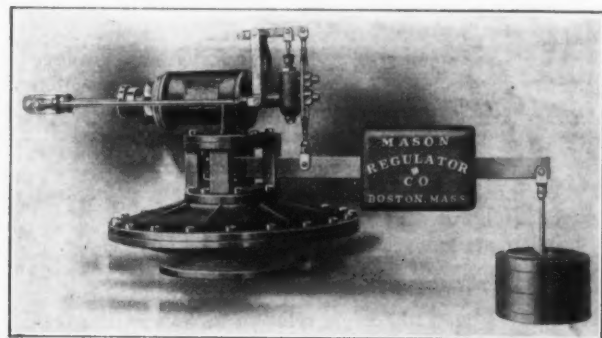


Fig. 2.—The Pressure Controller with Large Diaphragm and Compensating Attachment.

in diameter, having an area of about 7 sq. in., and unless otherwise specified is given a 3-in. stroke, though any stroke up to 10 in. can be furnished.

The regulator shown in section in Fig. 1 will make a complete stroke, operating a belt shifter, when there is a slight change in the pressure controlled. Where a graduated step by step movement is required, such as is desirable in operating electric rheostats, the controller is furnished with a compensating device, Fig. 2, which prevents it from making a complete stroke with each slight variation of pressure. Where a definite variation in pressure between stopping and starting the pump is required, the controller is equipped with a varying attachment, Fig. 3, which by the action of the two weighted

levers will stop the pump at the desired pressure and allow any predetermined drop in pressure to occur before the pump is again started.

To accomplish a continuous slow movement of the piston in one direction and normal speed on the return stroke, the controller is furnished with a retarding device, consisting of a check valve in the passage leading to one end of the operating cylinder, and an adjustable

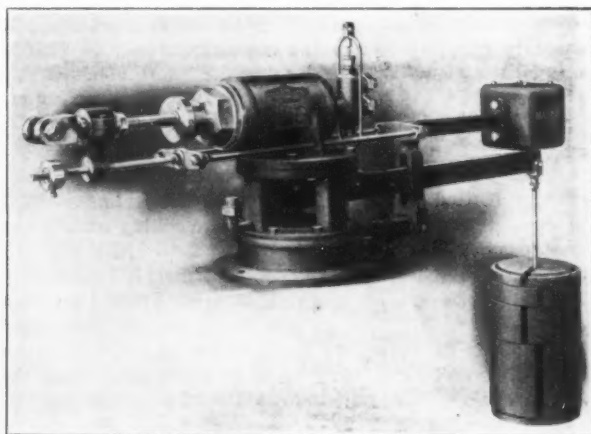


Fig. 3.—The Mason Horizontal Pressure Controlling Device with Varying Attachment.

needle valve located in a bypass around the check valve. The needle valve can be adjusted to cause the piston to move at any desired speed in one direction. When it is necessary to retard the piston in both directions, a small cock is attached to the exhaust from the pilot valve, which can be adjusted to slow travel.

Deep Wells That Feel the Sea.—The geologist of the United States Geological Survey in charge of the ground water investigations in Virginia states that changes in water level in wells, due to fluctuations in the height of the surface of some neighboring body of water, have been observed all over the world. It is customary to explain these changes by supposing a direct connection between the river, lake or bay; but in many places, as in eastern Virginia, such connection is clearly impossible, owing to the depth of the wells and the nature of the intervening beds, some of them dense, tough marls and clays. These beds, however, though they do not transmit water, nevertheless contain it, and as water is practically incompressible, any variation of level on the river or bay is transmitted to the well through the water filled gravels, sands, clays and marls. When a porous bed is tapped by a well the water rises to the point of equilibrium, and fluctuates as the hand of the ocean varies its pressure on the beds that confine the artesian flow.

Malaysian Tin Output.—The following table, furnished by Vice-Consul-General G. E. Chamberlin of Singapore shows the output of tin from the Federated Malay States for the first four months of the year 1906 and 1907:

	1906. Gross tons.	1907. Gross tons.
Perak	8,076	8,187
Selangor	5,255	5,967
Negri Sembilan.....	1,500	1,386
Pahang	636	623
Totals.....	15,467	15,263

It will be noticed that there is a falling off from last year's output of 204 tons. However, this is a slight gain for the months of March and April, as January and February showed a decrease of 272 tons.

Ohio, for the first time in many years, made no charcoal iron in the first half of 1907. There are six charcoal furnaces in the State, all being in the Hanging Rock District. In Pennsylvania only 620 tons of charcoal iron was produced in the first half of the year, three out of the State's five charcoal furnaces being active in some part of the six months.

Why Is It That Some Coals Coke and Others Do Not?*

BY F. C. KEIGHLEY, UNIONTOWN, PA.

The writer will not undertake for a moment to say that there is a complete answer to this question. It has been a matter of speculation among manufacturers and users of coke for the past 200 years as to what really is the factor that produces the coking tendency or characteristics of some coals. The remark is often heard that a certain coal will not coke. Sometimes the coking quality of a coal is decided upon by people who are wanting some special quality in the coke. . . .

John Fulton, Dr. William B. Phillips and Mr. Belden of the United States Fuel Testing Department have given a great deal of time and study to coking coal. They one and all declare that they do not know just why certain coals coke and others do not; in fact, it is said that we apparently are no nearer a solution of this question now than investigators in this line were 200 years ago. Taking this statement in its broadest sense, the writer believes it to be true, but he is of the opinion that the reason for many bituminous coals coking can at least be approximated.

There are coals that we know cannot be coked satisfactorily and profitably, no matter what the treatment may be. These coals might be classed as graphitic, anthracite and semianthracite coals. The truth of the matter is that these are not coals; they are really cokes. Graphitic coals are coals that have been coked, as it were, in nature's laboratory to an excess. Anthracite coal chemically comes very close to being an ideal coke. Semianthracite coal is a coke in which the coking process has not been fully completed.

It will suffice to say that this natural coking process has been brought about principally by heat originating from volcanic action, chemical action or compression, with accompanying distortion and displacement of the strata. In other words, the coals just referred to have been metamorphosed, and are sometimes referred to as metamorphic coals.

Classes of Bituminous Coals.

No attempts will be made to particularize the numerous classes of bituminous coals. For the purpose of the writer it will be sufficient to group them as follows: Semibituminous, bituminous and splinty bituminous. Semibituminous coal is somewhat difficult of treatment by reason of its lowness in volatile matter, while the splinty bituminous is equally difficult by reason of its more or less laminated structure. The bituminous variety will in all probability carry with it the greatest coking tendency, if the coal is in good condition and not greatly disturbed by faulting, &c.

Two other varieties or grades of coal might be considered in this connection—namely, the splint coals and the cannels. Splint coal at times possesses coking tendencies in a greater or less degree, and very often the chemical constituents of splint coal are almost identical with those of the finest grade of bituminous coking coal. It is this anomaly that so greatly worries the investigator into the coking tendencies of coals. As to the cannel coals, they certainly do not possess coking tendencies in a degree that would be worthy of consideration.

Physical Properties the Key.

It is widely known that not only are the finest coking coals of the bituminous class, but their structure is such that upon fracture they exhibit a fingery or prismatic form and separate vertically, while the coals more difficult to coke and the ones of a bituminous character that cannot be coked at all are of a laminated structure and upon fracture break into cubical form, with a tendency to separate horizontally instead of vertically. This would indicate that the coking property depends very largely upon the arrangement of the atoms or molecules composing the coal seam. If these atoms lie in the seam with their longer axis horizontal to the bedding of the seam, they are unfavorable to the coking process. On

the other hand, if they are perpendicular to the strike of the seam, *i. e.*, at right angles with its bedding, the coking tendency is much more pronounced. It is likely that in all seams the longer axes of the atoms are lying at angles to the horizontal or the vertical. This would explain some of the mystery. While pretty largely theory and speculative, still this line of reasoning is borne out by certain additional facts that cannot be ignored. . .

Coke is being made to-day from coal that 10 years ago was rejected as worthless for the purpose. Many people were attracted to such coals by the similarity of their chemical constituents to the Connellsville coking coal; yet while they would coke, the coke was unsuitable for the requirements of the consumer. Some of these coals were laminated in structure and others tended to the crystalline, and it has been proved now that all that was required to make many of these condensed coals produce a fine grade of coking coal was simply to break them up to a greater or less degree of fineness and destroy, as it were, the natural polarity of the atoms making up the coal seam. This was accomplished in various ways, namely, by crushing, disintegrating and pulverizing. It is evident then that the coking principle of coal is dependent to an important extent on its structure.

Disintegration Not a Universal Panacea.

Very often it has been found that a system of mixing greatly facilitates the coking process and the writer would not be surprised if at some time in the future large coke works will be located at railroad centers instead of at the coal mines, for the reason that at such centers different varieties of coal could be had and used in the various proportions needed to make up an ideal coke. It is not the intention of the writer to convey the idea that crushing, pulverizing and disintegrating alone will produce coking tendencies. There are other factors, but their importance is probably of a varying degree. He will admit that the proportions of fixed carbon, volatile matter, ash, phosphorus and sulphur all contribute more or less to produce that coking property. He will go farther and say that in all probability the constituents of the ash in the coke contribute to it in a degree when certain proportions of silica and alumina exist. In some coals the proportions of alkalies no doubt have more or less effect, and it is well known that moisture in the coal has an adverse influence if it is present above a well known percentage.

It is probable that phosphorus, which is generally considered a deleterious element, is one of the important agents in producing the fusing qualities in the coal. Up to a certain degree it is often very desirable to the maker of fine castings, and the reason is that it imparts fluidity to the metal smelted by coke carrying a certain percentage of phosphorus. There is no reason to believe that it does not have the same action upon the various constituents of the coal, possibly the more refractory ones.

Purity Not a Desideratum.

Pure coke, like pure iron, is absolutely worthless for practical purposes. It is often said of irons or cokes that they are remarkably pure; but this is a falsity. We cannot conceive of a coke without ash; in fact, coke could not exist if the ash were not present in a greater or less degree. It holds the same relation to coke as the framework in the building to the whole structure. The ash forms the nucleus around which the atoms of carbon arrange themselves in the coking process, just as the honeycomb forms a receptacle for the honey. Lowness in ash is the reason why some of the purest coals in the State do not produce the finest cokes.

This holds good in a less degree with the less important constituents; if the sulphur and phosphorus were eliminated altogether it is probable the coke would be unsuitable for many purposes. Taking all these facts into consideration, it would seem that it cannot be positively stated that the coking properties of certain coals are wholly produced by reason of conditions resulting from the presence of certain elements in certain proportions. Hence the writer's contention that an important factor is the position or angle in which the atoms composing the coal seams lie. They may lie in an unfavorable position, and the remedy would be to break it up

* From the presidential address at the Pittsburgh meeting of the Coal Mining Institute of America, June, 1907.

and put the particles of coal in such position that they can lend themselves to the coking process. . . .

Why Connellsville Coal Cokes Easily.

Connellsville coal cokes naturally and will make good coke in the commonest form of oven with the minimum expenditure of capital and labor. Yet even this coal, possessed of every natural advantage, can be improved by crushing to uniform size, which is another strong argument in favor of the writer's theory that changing the position of the atoms is conducive to coking operations.

A close examination of the Connellsville coking coal reveals the fact that its general structure is distinctly prismoidal, just the reverse of the laminated structure of the Briar Hill block coal, for example, which will not coke at all unless it is put through a course of treatment that as yet has never been perfected. However, there are portions of the seam that show a greater or less degree of lamination and there are also several binders that are of a bony or cannel like form; but all seem to possess the property of fusion in a high degree, which in a measure counteracts their otherwise adverse tendency.

This Connellsville seam of coal ranges from 6 to 9 ft. in thickness, and as the bulk of it is of prismoidal structure it naturally aids the mixing process by breaking up into small pieces when it is mined and handled from face to car, car to bin, bin to larry, and larry to oven. If the seam were sampled in 6-in. sections and analyzed accordingly, it would be found that there is much variation in the chemical constituents of the various sections, and probably some particular portions would not make merchantable coke if separated from the others. In fact, the writer has seen enough in the way of experiments with this coal to believe it to be the case. Therefore it is clear to him that prismoidal structure of the coal is one of the most important factors in coking coal. If the coal to be used for coke manufacture does not possess that structure naturally, then it must be and often is broken up so as to destroy the lamination, which is only another way of expressing the changing of the polarity of the atoms. Briefly stated, coals with the longer axis of their atoms lying parallel to the bedding—*i. e.*, horizontal planes—mean laminated structure, unless the same has been broken up by some movement of the inclosing strata, as evidently occurred in the case of the Connellsville seam. Lamination or horizontal planes obstruct the coking process.

Coals in which the longer axis of their atoms inclines to the vertical—*i. e.*, vertical planes—facilitate the coking process. No doubt the query will suggest itself, Does crushing actually change the horizontal plane to the vertical position? It certainly does not, in the strictest sense, but it brings about the same effect by reducing the broken coal to comparatively uniform shape—*i. e.*, the horizontal and vertical planes are thus made so nearly equal that mixing of the particles, evolution and diffusion of the gases, and their permeating freely through the whole mass are greatly facilitated, resulting in a homogeneous product of high quality. Although the writer is not inclined to make any particular claim that the position of the planes influences the coal and coke chemically, yet it must be patent that the horizontal planes would, to some extent, prevent the free passage of the deleterious elements as they are evolved during the coking process, and that the vertical planes would, if anything, facilitate their exit.

Coking and Noncoking Properties.

A careful study of the facts herewith presented has led the writer to believe that the reasons for some coals coking or submitting themselves naturally and readily to the coking process and furnishing a high grade coke are as follows:

1. They are in structure largely prismoidal, permitting the free mixing of the particles, diffusion of gases, &c.
2. Their chemical composition is such that they contain not only the fusing and cementing factors in the most favorable proportions, but they carry the most desirable elements in those proportions and the form best adapted to the purpose for which the coke is required.

The reasons some coals are not naturally fitted for

the coking process, but yield high grade coke after disintegration, are as follows:

1. Their structure is largely of a laminated character, thus presenting obstacles to the free mixing of the particles and diffusion of gases.
2. Their chemical composition is not widely different from those of the natural coking coals, but they cannot adjust themselves to the necessary processes of fusion, cementation and interchange of position of the different elements the complete coking process requires, unless the coal has first been disintegrated or pulverized.

Where Special Treatment Is Necessary.

There are coals that possess all the necessary factors to produce high grade coke and yet they fail to respond to ordinary treatment, and that is because two different grades of coal are embraced within the one seam—one being extremely rich and the other being lean. The consequent difference of densities has the effect of separating the respective qualities when the coal is put into the coke ovens in the ordinary way. The writer had an experience with a coal of this kind, the chemical composition of which was extremely good, but physically the resulting coke was weak, and, as a consequence, unfitted for a smelting fuel. A system of disintegrating and pulverizing was installed, with the result that the product was of A1 character, both chemically and physically. This is another illustration of physical effect carried by the coal and inherited by the coke.

Only a few days ago the writer was called upon to examine the product of a coal seam that was producing a good article of coke chemically, and to all appearances strong physically, yet the coke was a failure in the work at the furnace. A close examination of the coke disclosed the fact that no less than four different sizes of cells existed in its body. These cells seemed to group, as it were, in the coking process, the dense structure being on the outside and the most open in the center of the crystals. This structure made it possible for the blast to attack the center so rapidly that the coke collapsed before it got to the usual melting zone in the furnace, making bad work. Upon examining the coal it was found that 3 ft. of the seam was composed of extremely rich coal, 1 ft. of a very lean or bony coal, and two other portions, aggregating about 3 ft., were of compositions ranging from rich to lean. Here we have a case of different densities or physical structure, as well as chemical composition, with the result that the different kinds of coal separated from each other more or less and caused wide variations in the cell structure. Mixing and pulverizing were advised, and there is no doubt that such treatment will remedy the whole trouble.

A trial of the effect of removing the bone or lean coal was made and found to be ineffectual; in fact, the bone or lean coal was necessary to balance the chemical composition—*i. e.*, it counteracted some of the undesirable tendencies of the richer portions of the seam. This is an additional proof of the effect of physical conditions of the coal being carried over into the coke.

A Plurality of Coking Properties.

These practical demonstrations of the physical or structural condition of the coal itself having an important bearing on the coking process have led the writer to believe that the coking principle or process is not inherent in any one factor or element alone embodied in the coal, but that it is a result or condition brought about by the combination of several factors and elements of both chemical and physical character, a condition somewhat of the order of that of fermentation, and the success of that process is graduated from favorable to unfavorable, in accordance with the favorable or unfavorable proportions of such factors and elements existing in the coal itself. The writer further considers coke a compound, and is of the opinion that within certain limits coke can be made up to conform with formulas that define certain proportions of chemical constituents, as well as physical conditions that will fit it for certain requirements; in fact, this is done now to some extent by the preparation and mixing of the coal as before cited.

Again, the writer believes that it is possible to make and put into form mechanically, without the aid of the burning or fermenting process, a preparation made from a mixture of the desirable grades of coal, that would answer the purposes of coke. It is perhaps true that before success would be achieved in this line present iron smelting practices would have to be modified. In this connection it might be well to remark that a change in blast furnace practice made the use of what is known as Klondike coke possible.

It has been a mystery to the majority of cokemen why the great Klondike coal field was so long condemned by blast furnace operators, but it is no mystery to the men that were conversant with the facts and conditions existing some years ago in blast furnace operation. It was known for over a quarter of a century that the Klondike coal of Fayette County was chemically fitted for the manufacture of a high grade coke, but lacked in certain physical requirements the iron maker was compelled to ask for by reason of the comparatively weak blast then in use. With the advent of high pressure furnace blowing a dense coke similar to the Klondike product was not a detriment to the operation of the furnace, but, as the furnaces grew in height and capacity, thus causing a great increase in the burden placed upon the coke, greater density in the coke became almost a necessity, and then, and not until then, did the Klondike product rear its head, as it were, and receive its crown.

In conclusion it will not be amiss to direct attention to the fact that the Klondike coke of Fayette County, Pennsylvania, is an indisputable proof that the physical structure of the coal does carry over into the coke. The Klondike coking coal was turned down wholly for the reason that the resulting coke was very dense in structure and the prisms or crystals easily broken up, thus making the coke small in size when reaching the charging barrows at the furnace.

A Shippers' Traffic Managers' Association.

Traffic managers representing over 13,000 business firms and corporations assembled in Chicago August 2 to discuss plans for the formation of a national traffic association. It is the belief of those interested in this movement that united co-operation between a national organization of shippers on the one hand and the Interstate Commerce Commission and the railroads on the other would be helpful in securing the formation of rules and regulations equitable to all interests and at the same time exercise a wholesome influence in restraint of rash and ill considered legislation. Membership in the proposed association is open to the traffic managers of all firms and corporations of the United States and Canada, and it is desired that its membership shall include and represent every important industry. Another meeting of those interested in this movement is scheduled to be held in Chicago August 29. The aims and object of the association are presented in the following statement:

Believing that publicity in transportation matters is essential to a complete and harmonious understanding of the relations between the public common carriers and legislators, this organization stands for and will undertake to promote, through the medium of its officers and organization, thorough knowledge of transportation affairs necessary to accomplish this object; also for the purpose of obtaining clearly defined laws governing interstate traffic; to interchange views regarding interstate legislation that does or may affect interstate commerce, that will relieve the public of all uncertainty as to its relations to the carriers; also for the purpose of acquainting the regular established tribunals of the needs of the shipping interests and the effect on commerce of rulings, decisions and practices either fixed or to be determined by such bodies.

The meeting was organized by the election of L. A. Clark, Bell Brothers Glass Mfg. Company, Muncie, Ind., as temporary chairman, and Lewis B. Boswell, freight bureau commissioner, Quincy, Ill., temporary secretary. A permanent organization was perfected by the election of the following officers: President, J. C. Lincoln, Merchants' Exchange, St. Louis, Mo.; vice-president, W. D. Everest, Westinghouse Mfg. & Electric Company, Pittsburgh, Pa.; secretary-treasurer, E. B. Boyd, Board of Trade, Chicago, Ill.

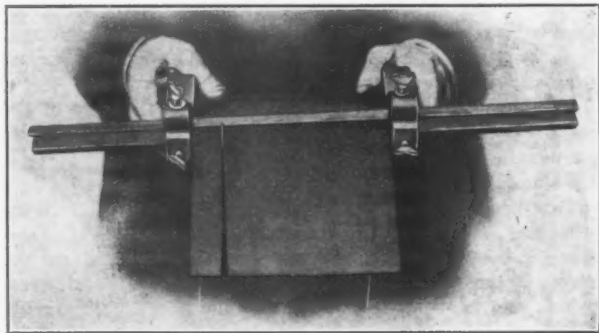
Something of the interest manifested in this movement is indicated by the high character of the firms and

corporations participating in it. The representatives present at the meeting were as follows:

J. M. Allen, Merchants and Shippers' Association, Rockford, Ill.
Charles F. Ballard, Grain and Milling Association, Louisville, Ky.
Henry S. Bassett, Chamber of Commerce, Pittsburgh, Pa.
Oscar F. Bell, Illinois Manufacturers' Association, Chicago.
H. C. Barlow, Association of Commerce, Chicago.
L. B. Boswell, Freight Bureau, Quincy, Ill.
L. A. Clark, Commercial Club, Muncie, Ind.
P. W. Coyle, Business Men's League, St. Louis, Mo.
J. M. Guild, Commercial Club, Omaha, Neb.
J. Keavy, Freight Bureau, Indianapolis, Ind.
J. F. Morrison, National Association Implement and Vehicle Manufacturers, Racine, Wis.
U. S. Pawkett, Freight Bureau, Fort Worth, Texas.
J. F. Ryan, Chamber of Commerce, Toledo, Ohio.
J. C. Lincoln, Merchants' Exchange, St. Louis, Mo.
E. J. McVann, Grain Exchange, Omaha, Neb.
H. G. Wilson, Board of Trade, Kansas City, Mo.
E. B. Boyd, Board of Trade, Chicago.
J. J. Telford, Board of Trade, Louisville, Ky.
E. G. Wylie, Greater Des Moines Club, Des Moines, Iowa.
W. A. Sproul, Cambria Steel Company, Philadelphia, Pa.
B. H. O'Meara, Douglas & Co., Cedar Rapids, Iowa.
F. A. Ogden, Jones & Laughlin Steel Company, Pittsburgh, Pa.
H. R. Moore, Tennessee Coal, Iron & Railroad Company, Birmingham, Ala.
Frank B. Montgomery, International Harvester Company, Chicago.
W. R. Orr, National Fireproofing Company, Pittsburgh, Pa.
A. R. Oxtoby, La Belle Iron Works, Steubenville, Ohio.
L. R. Richards, Quaker Oats Company, Chicago.
J. M. Belleville, Pittsburgh Plate Glass Company, Pittsburgh, Pa.
Charles Bellesterling, American Bridge Company, Chicago.
Frank T. Bentley, Illinois Steel Company, Chicago.
L. C. Blehler, Carnegie Steel Company, Pittsburgh, Pa.
L. A. Constans, Pittsburgh Steel Company, Pittsburgh, Pa.
A. B. Ewer, Harbison-Walker Refractories Company, Pittsburgh, Pa.
H. E. Graham, Pressed Steel Car Company, Pittsburgh, Pa.

The More Belt Cutter.

A convenience to the millwright department of any factory is a little device herewith illustrated, known as the More belt cutter, for which Philipps & Troup, Dayton,



The More Belt Cutter, Sold by Philipps & Troup, Dayton, Ohio.

ton, Ohio, are the agents. Briefly it is a device for reducing the width of a belt, or for cutting a narrower belt from wider stock.

The handles of the cutters are made of cast iron and the rods of steel. All of the parts are adjusted with thumb screws, and it is possible to very quickly adjust the cutter to cut any size of belt into any narrower size desired. The handles are drilled and adjusted before leaving the makers so that the cutting made in a belt will be perfectly straight. The weight of the cutter is about 12 lb.

The cutter is especially useful in large factories where it has heretofore been necessary to carry a large stock of belts. By using one of these cutters one large stock may be carried and cut to whatever sizes may be needed. The same is true where a dealer is concerned; he does not need to carry all sizes of stock, but having one of these cutters is able to fill an order for any width, either standard or special.

It is claimed that with the More belt cutter a belt as wide as 16 in. and 100 ft. long may be cut to any intermediate width in less than 10 min., and that no experience is required. The principle of its use is brought out in the illustration, showing the manner of holding it and cutting a belt.

A New Canadian Pipe and Car Wheel Foundry.

BY L. H. STANTON, WINNIPEG, MAN.

The Canadian Iron & Foundry Company, with head office at Montreal, is now completing at Fort William, Ont., and will have in operation this fall, a plant for the manufacture of cast iron pipe and cast iron car wheels. It is intended to take care of the company's Western business and will serve the country from the head of the Great Lakes to the Rocky Mountains. The construction and laying out of the plant is in charge of G. R. Duncan, formerly engineer and superintendent of the company's works at Three Rivers, Que. The plant is designed from the experience gained at Three Rivers and is planned for a continuous cycle of operations, making it possible to work three shifts in a 24-hr. day. The accompanying plan sketch is from the company's drawings.

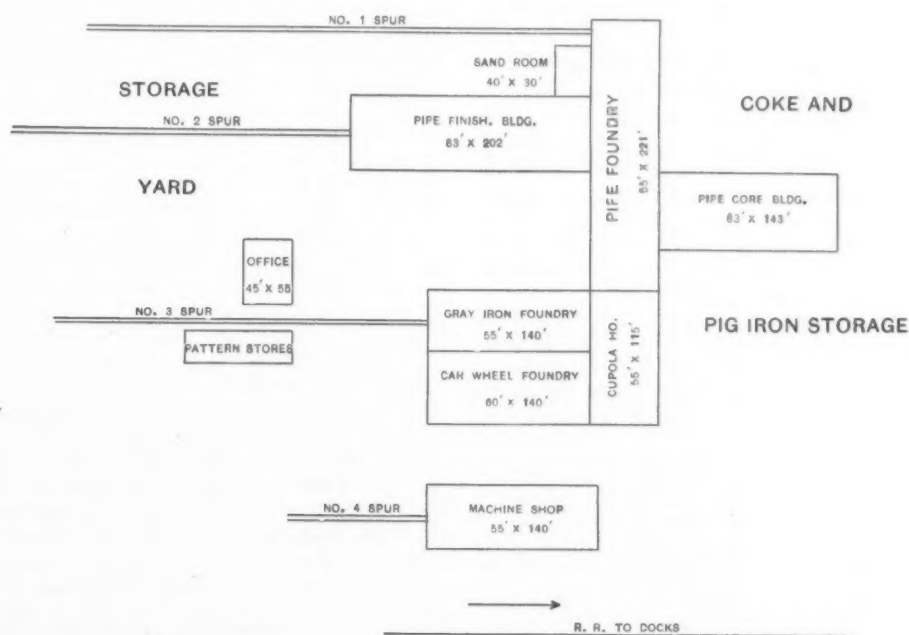
The company has secured 40 acres of land, with a river frontage on the south side and railroad lines of the Canadian Northern and Grand Trunk Pacific on the north side. Kaministiquia River at this point is navigable for vessels of 14-ft. draft, and pig iron from Great Britain or the Continent can be delivered at the com-

are dipped, given a hydrostatic test, weighed and piled in the storage yards ready for shipment. The capacity of the plant is 100 tons per 10-hr. day for pipe alone.

Each department is equipped in duplicate, including cranes, cupolas, core oven and pipe skids. In the cupola room there are four cupolas, two each for the car wheel and pipe sections. Railroad tracks are laid into each of the main buildings, permitting the rapid and economical handling of materials. Outside of the two departments mentioned only the heaviest forms of general foundry work will be undertaken, and only those which call for little mechanical labor. Columns and cast structural shapes will be handled, but nothing which necessitates extensive finishing.

The officers of the company are Edgar McDougall, president; Thomas J. Drummond, vice-president; F. G. O'Grady, secretary-treasurer; J. A. Kilpatrick, general superintendent; G. R. Duncan, engineer. The company has plants at Three Rivers, Que.; Londonderry, N. S.; Hamilton, Ont.; St. Thomas, Ont.; Fort William, Ont., and Montreal, Que.

The Tennessee Company's Open Hearth Plant.—The Tennessee Coal, Iron & Railroad Company expects to



Layout of the Canadian Iron & Foundry Company's New Fort William Plant.

pany's docks without breaking cargo en route. Coke from ports on the lower lakes can be delivered in like manner, and the Kaministiquia Power Company supplies electrical power at a reasonable cost.

In operation the molds are set up in the pit adjoining the sand room. After being rammed they are moved forward on an endless chain to the black washing section, and from that are deposited on a transfer table and are moved across to the opposite side of the pit. By means of a hydraulic plunger they are moved forward into the drying room and released at the opposite end when this portion of the process is completed. Continuing, the cores are set, after which the carrier reaches a second transfer table and the flask is brought to the pouring pit, where the capsules are reversed and the metal poured. Thence the flask passes along to the first drawing pit, where the cores are taken out, and in turn to the second, where the pipe is drawn and taken through to the pipe finishing room. The sand from the mold falls into a deep pit and is elevated by a bucket carrier to the mixing room, where it is again made ready for use.

In the second room there are similar provisions for doing away with manual labor, one of the heaviest items of cost in the West country. Chain cleaners are used for clearing the inside of the pipe and pneumatic chippers for the outside finishing. After being heated the pipes

start in September the first of its four large open hearth furnaces now building at Ensley, Ala. The others will follow at intervals and all are expected to be active in November. Each has a capacity of 200 tons a day. Meantime, work will be begun on two more 65-ton furnaces, making the ultimate capacity of the new plant about 1200 tons a day, with all allowance for repairs. When the four furnaces are in operation, late in the year, it is the intention to shut down all the present open hearth plant, except the stationary furnace, No. 11, and perhaps two or three of the tilting furnaces, which adjoin the new plant. Ultimately, all the old furnaces will be dismantled.

The University of Minnesota Bulletin announces the courses for 1907-1908 in the College of Engineering and the Mechanic Arts at the University of Minnesota, Minneapolis. It gives the university year calendar; the departments of the university; officers, committees and faculty; purposes of the college, which offers courses in civil, mechanical, electrical and municipal engineering and graduate work leading to the degree of doctor of science; entrance requirements, and general information of interest to prospective students, including courses of instruction, brief description of buildings and equipment and list of present students.

The Hardening of High Speed Steel Taps.

A long and careful series of tests conducted by Wheelock, Lovejoy & Co., Boston and New York, has demonstrated that the hardening of high speed steel taps, hobs and other tools where accurate size is a very essential consideration can be successfully accomplished by the medium of a barium chloride bath in a standard gas hardening furnace. The investigations were carried out in connection with the firm's brand of Blue Chip high speed steel, but the results may be secured equally well with other steels of the same general class. The process has passed the experimental stage and is now being applied commercially with pronounced success, as vouched for by well-known manufacturers of taps, cutters, dies, &c.

The application of barium chloride for this purpose was first developed abroad with an electric furnace. Its use in a gas furnace very much decreases its cost. Wheelock, Lovejoy & Co. use a furnace of the type manufactured by the American Gas Furnace Company, Elizabeth, N. J. The chemical, in crystal form, is placed in a crucible in the furnace, and melts into a bluish, milky fluid at a temperature of between 1600 and 1700 degrees F. As a hardening bath, its temperature varies from 2000 to 2300 degrees, according to the nature of the part to be treated and its size.

Remarkable Uniformity of Results.

The process works without appreciable variations in results where conditions are made the same. At a given temperature and with equal time of exposure to the heat any number of pieces of the same size and shape are practically identical in hardness, and, most important of all, identical in size. The variation is a fixed, known amount. There is a certain expansion, but it can be ascertained, and may be depended upon to remain the same through the hardening of an indefinite number of identical parts, as, for instance, a lot of taps. Once the amount of expansion is ascertained by a series of tests the necessary correction may be made before hardening in the machining of the tool, so that where unusually exact sizes are desired it is not a difficult matter to obtain them.

No allowance need be made for loss in size due to oxidation. The difficulty in the way of the successful hardening of such a high speed steel tool as a tap in fire in the ordinary way is that oxidation takes place with exposure to the air, with corresponding loss of dimension. This loss is an uncertain factor. The variation from any standard size is so marked and so irregular, comparing results in several parts of the same size and form, as to render the method undesirable, even impossible, according to general experience. This shrinkage does not occur in the barium chloride bath. No oxidation can take place, for there is no exposure to the air, either in the furnace or in transferring from the furnace to the quenching bath.

Examples of Practical Experience.

Results in practical manufacturing demonstrate the success of the process. A set of Blue Chip taps, hardened for a prominent tap manufacturer, and which were cut to measure exactly 1.1602 in. in diameter, measured after hardening 1.1599, 1.1608, 1.161, 1.1617, 1.162 and 1.1621 in. The change in lead was only about 0.00025 in. in 1 in. These changes, according to the manufacturer who made the taps, were not so great as would be expected in taps of this size made of ordinary carbon steel.

Another tap manufacturer writes, as his experience with the process, that he has examined $\frac{5}{8}$ -in. U. S. S. Blue Chip taps which had been hardened and had found that they had increased in size 0.001 in. and that they went off in lead 0.0005 in. to the inch.

While these variations are small, they are by no means unimportant in the treatment of tools the size of which must, from their uses, be truly accurate, and it is for this reason that the reliability of the process is so very important. By means of tests, the necessary knowledge is obtained for a standard treatment of any size or type of tool. There are found the exact temperature required in the furnace, applied in practice by means of a

pyrometer; the exact length of time of heating, and the exact amount of expansion obtained under these known conditions. The $\frac{5}{8}$ -in. tap subjected to a temperature of 2100 degrees for four minutes gives an expansion of 0.001 in. The correction for this can be made easily in the machining.

Hardening a Part of a Die.

A rivet heading die $1\frac{1}{4}$ in. in diameter reveals another advantage of the process. It is desirable that not all of the die be hardened, in order that there may be a tough soft backing for the working end. To bring this about, only the die end is submerged in the bath, so that that part alone is hardened, excepting as there is some drawing upward above the surface of the chemical, resulting in a section of metal in which the degree of hardness is tapered off to nothing. A high speed rivet heading die hardened in this manner, will stand for 70 hr., while the life of a die of the same sort of carbon steel, working under the same condition, will seldom retain its usefulness for more than 6 hr. Such a die is hardened at a temperature of 2100 degrees and is drawn in oil at 425 degrees.

It is stated that a $\frac{3}{4}$ -in. high speed steel tap was used by a certain manufacturer for four months in an upright drill in drilling steel and cast iron without being obliged to grind it. Some of the work which this tap did was in tapping out 4000 drop forged steel acorn nuts. On this this work alone a regular carbon steel tap would not stand up at the most for more than 10 of these forgings without being ground, and sometimes the tap would be entirely useless. Another manufacturer made use of a number of $\frac{3}{4}$ -in. pipe taps in tapping malleable iron pipe fittings, which is supposed to be one of the hardest tests to which this class of tool is subjected. The high speed taps averaged to tap 9400 pieces each, whereas the regular carbon steel taps would average from 2700 to 2800. In tapping soft steel nuts a $\frac{5}{8}$ -in. high speed tool averaged to tap from 47,000 to 48,000, whereas the ordinary carbon steel tap would not average over 10,000 to 11,000.

In the use of the various barium chloride processes very careful records are maintained of all tools hardened. The temperature and time are carefully noted and filed, with the name of the customer. In this way every opportunity for improvement in the use of the process for any particular part is ascertained, and the knowledge thus gained is put into practice, and when desirable tests are made to alleviate any weakness. But once the standard of treatment is learned it is consistently carried out. The operator at the furnace is given no latitude in his work. With each tool or lot of tools given him to harden he receives careful written directions. He has but to watch the pyrometer and the clock and the excellence of results is assured.

The Lignite of North Dakota.

All of the mineral fuel produced in North Dakota is lignite, according to W. Parker of the United States Geological Survey. Extensive beds underlie the greater part of the western half of the State. The deposits vary in thickness from a few inches to 33 ft. The production in 1906 was 305,689 net tons. The lignite is brown and generally woody, and as it comes from the mine contains about 40 per cent. of moisture. On exposure to the atmosphere it loses some of this moisture, and as a result it slacks or crumbles to pieces. If exposed indefinitely it breaks down to a fine powder, with probably considerable oxidation and loss of volatile combustible matter. On account of its heavy percentage of moisture and rapid disintegration on exposure it does not stand transportation well. The lignite is not of high value for heating, and many efforts have been made to render it more serviceable. Briquetting has thus far not proved very successful, but it is hoped that some method may yet be devised by which this fuel may be more satisfactorily utilized.

The Falls Machine Company, Sheboygan Falls, Wis., the operation of whose plant was recently interrupted by a machinists' strike, is again running full handed with nonunion help.

Segregation in Steel.

An Investigation by John E. Stead.

At the recent Engineering Conference of the English Institution of Civil Engineers, a discussion on the above subject was opened by John E. Stead of Middlesbrough, who read a paper, of which an abstract is given below. It is almost needless to say that Mr. Stead is one of the foremost authorities on the metallurgy of iron and steel, being a Bessemer medallist, and that a paper from him on this timely subject is of great value.

Segregation Not Always at the Top of Ingots.

The term segregation practically explains itself, but for many years it has been assumed that the gathering together of the metalloidal portions was confined to near the upper portion of the central axes of ingots. Local concentration of the sulphur, phosphorus and carbon, however, is also found in many other positions. This has been proved by the invaluable method of examining the complete sections of ingots or forged materials after the surfaces of the steel have been polished and etched in a suitable way. The structures thus revealed are so varied and peculiar that we are forced to recognize that the simple explanation of how segregation is affected, so long held by metallurgists, requires material qualifications. The etched specimens exhibited by the author showed that the darker shades, which indicate phosphorus segregation, are located in the following positions:

1. In varying degrees of density in the central axes.
2. In annular irregular rings at varying distances between the external envelope and the central axes.
3. In spots at variable distances apart from each other, but at approximately equal distances from the external envelopes.
4. In spots distributed irregularly over the whole sections, but not in the external envelopes.
5. In two or more positions corresponding to Nos. 1, 2 and 3.
6. In some of the specimens, the central axes are purer than the mass of metal surrounding it.

Before proceeding to give what he thought were reasonable explanations of some of these phenomena, such facts as are universally accepted were stated by Mr. Stead:

Acknowledged Facts.

1. That the purer crystallites fall out of solution in advance, leaving a less pure liquid metal, and that at one stage of the gradual solidification the metal is a pasty mass, consisting of the purer solid part and an impure liquid portion.
2. That from some cause or causes, some of the more impure liquid is rejected from the surface of the freezing walls in ingots. This ascends and finally lodges under the solid upper crust of the ingots, where it eventually freezes.
3. That steel which is wild after pouring into the mold is usually badly segregated.
4. That steel cast at abnormally high temperatures, or what is equivalent, very slowly cooled, favors axial segregation of the impurities.
5. That the addition of a small quantity of aluminum to liquid steel, which is practiced by steel makers for the purpose of producing quietness in the mold and soundness in the steel, also reduces axial segregation.
6. That not only does aluminum effect the reduction of axial segregation, but, as is proved by the microstructures of the specimens exhibited, it almost completely removes the minor or dark spot segregations.
7. That sulphur segregates the most, and phosphorus is intermediate between sulphur and carbon in this respect.

Hypothetical Conclusions.

1. That as the segregate rejected from the freezing steel is specifically lighter than the liquid steel, it will on that account float upward along the freezing walls of the ingot.

2. That the gases driven off from the freezing walls must accelerate the ascent of the segregate, and therefore anything which will reduce or prevent the elimination of gas must tend to check the rate at which the more impure liquid ascends.

3. That gas blow holes, which can only form in the plastic mixture of solid pure crystallites and impure liquid, must exert considerable pressure on the pasty metal, and it seems almost certain that some of the impure liquid will be squeezed out, escape into and join the liquid adjoining the freezing walls; therefore, under certain conditions, the formation of blow holes must increase axial segregation.

4. Because the segregate rises to the top of the still fluid column, there must be a central descending slow current. This current, in passing over the very slowly freezing lower part of the ingot, deposits the purer crystallites. The impure liquid then flows horizontally to the vertical walls, and ascends, but as the walls develop and grow out of the liquid facing them, solid layers must be formed richer in impurities than the average steel. In this way the annular rings or fringes are explained, as well as the purer metal in the lower central axes.

6. The rings of independent dark spots are accounted for by the assumption that some of the gas in the blow holes, after exerting its pressure escapes, and that a portion of the impure liquid enters and more or less completely fills them. Some of the holes have actually been found lined with more impure metal.

7. The irregularly distributed dark spots may also be due to the land locking of the segregate between the branches of the large primary crystals.

Effect of Segregation of the Mechanical Properties.

All steel makers are alive to the fact that segregation as a rule is an undoubted evil which should be avoided. It is important, however, to discuss how and where the evil effect reveals itself, and also where it does not appear to have a pronounced effect.

The following conclusions are based on Mr. Stead's experience, and although as he says, "what I say is based on the observation of perhaps an insufficient number of cases," they are not the less of great value. It is only since the method of developing the structure of the entire section has been developed that the most useful evidence has been obtained.

1. Segregated steel generally fails prematurely when subjected to severe distortion in the cold.
2. Axial segregation in gun barrels interferes with drilling the bore. The drill becomes more or less diverted in its course.
3. The most segregated parts of steel ingots made for engineering machinery are almost, without exception removed, and only the lower parts actually used.
4. The rails made from the upper parts of ingots are always more fragile than those made from other parts (From the evidence at his command, Mr. Stead doubts whether the segregation in rails, unless very extreme and accompanied by unsoundness, leads to premature fracture in the track.)
5. Axial segregation in ship plate does not appear to be harmful. In boiler plates, however, it is a decided evil, and should be avoided.
6. There is no evidence that segregation in steel castings has been the direct cause of their failure when in use.

It must be remembered that failure due to unsoundness is common whether accompanied by segregation or not, and it requires most careful research to determine, when both conditions are present, which is the contributing cause.

G. B. W.

The St. Louis branch of the Parlin & Orendorff Company, Canton, Ill., has been incorporated under the name of the Parlin & Orendorff Machinery Company. This step was the outgrowth of a large increase of business at St. Louis, to handle which a more complete organization was needed. The business will be continued as heretofore under the direction of H. M. Blake, vice-president and manager.

The Electrolytic Theory of the Corrosion of Iron.

Experiments in Its Demonstration as Made by Dr. Allerton S. Cushman,
Washington, D. C.

(With Supplement.)

A noteworthy paper on the "Corrosion of Iron" was presented at the Atlantic City meeting of the American Society for Testing Materials, June 20, by Allerton S. Cushman, assistant director, Office of Public Roads, Department of Agriculture, Washington, D. C. It was given up largely to reciting and illustrating experiments Dr. Cushman has conducted which go to establish the electrolytic theory of the corrosion of iron, and emphasized particularly what he had learned as to the power of chromic acid and its salts to inhibit rust formation. Bulletin No. 30 of the Department of Agriculture, which has come from the press in the past two weeks, contains in full Dr. Cushman's account of his experiments. In transmitting it to the Secretary of Agriculture the author says that "the development of a sheet iron culvert which shall be at the same time strong, light and resistant to corrosion will be of great assistance to road builders," and adds: "It is probable that the efforts of the special Committee on the Corrosion of Iron and Steel appointed by the American Society for Testing Materials, of which the author of this bulletin is the chairman, will succeed in bringing about an improvement in the quality of metal manufactured for culverts, fence wire and other purposes of importance to agriculture."

The Carbonic Acid and Hydrogen Peroxide Theories.

The early pages of the paper are given to a discussion of the theory that without the interaction of carbonic or some other acid the oxidation of iron cannot take place. This is prefaced by the following general statement concerning the rusting of iron and steel:

It is well known that the various kinds of merchantable iron and steel differ, within wide limits, in their resistance, not only to the ordinary processes of oxidation known as rusting, but also to other corrosive influences. It is also true that different specimens of one and the same kind of iron or steel will show great variability in resistance to corrosion under the conditions of use and service. The causes of this variability are undoubtedly numerous and complex, and it is safe to say that the subject is not nearly so well understood at the present time as it should be. In regard to two points all investigators are agreed, and as these furnish at least some common ground it is interesting to record them before proceeding to a discussion of the points at issue. Iron cannot rust in air or oxygen unless water is present, and on the other hand it cannot rust in water unless oxygen is present.

Dr. Cushman then details experiments he made to confirm the conclusion of Dunstan and others that if carbonic acid plays any role whatever in rusting it is an unimportant one, in opposition to the claim of Crace Calvert and Crum Brown, later vigorously upheld by Moody, that with water and oxygen quite free from carbonic acid iron cannot rust. Similarly the claim is taken up by the writer, that iron cannot rust unless hydrogen peroxide is formed as a transition step in the reaction. Dr. Cushman asserts that while the theory is interesting and suggestive, it is not supported by the facts. "If," he argues, "the formation of hydrogen peroxide is a necessary stage in the rusting of iron and this is inhibited by certain substances which destroy hydrogen peroxide, why is not the inhibition extended to strong reducing agents generally?"

The Electrolytic Theory.

As preliminary to the account of his experiments to demonstrate electrolytic action and how it may be prohibited, the author says that the theory of electrolysis is the only one that finds no difficulty in appropriating the facts of the alkaline inhibition of oxidation. The electrolytic theory is then taken up, with this preliminary statement:

From the standpoint of the modern theory of solutions, all reactions which take place in the wet way are attended with certain readjustments of the electrical states of the reacting ions. The electrolytic theory of rusting assumes that before iron can oxidize in the wet way it must first pass into solution as a ferrous ion. The subject has been interestingly treated by Whitney, who discussed it from the standpoint of Nernst's con-

ception of the source of electromotive force between a metal and a solution. When a strip of metallic iron is placed in a solution of copper sulphate, iron passes into solution and copper is deposited, this change being of course accompanied by a transfer of electrical charge from the ions of copper to those of iron. Hydrogen acts as a metal and is electrolytically classed with copper in relation to iron. If, therefore, we immerse a strip of iron in a solution containing hydrogen ions, an exactly similar reaction will take place, iron will go into solution, and hydrogen will pass from the electrically charged or ionic to the atomic or gaseous condition. In such a system the solution of the iron, and, therefore, its subsequent oxidation, must be accompanied by a "precipitation" or setting free of hydrogen. It is very well known that solutions of ferrous salts as well as freshly precipitated ferrous hydroxide, are rapidly oxidized by the free oxygen of the air to the ferric condition, so that if the electrolytic theory can account for the original solution of the iron the explanation of rusting becomes an exceedingly simple one.

As iron has been shown by Whitney, Dunstan and the writer to rust in the presence of pure water and oxygen alone, the electrolytic theory as a fundamental cause of the wet oxidation of iron must stand or fall on the determination of one crucial question—viz., Does iron pass into solution, even to the slightest extent, in pure water? If iron does dissolve, the electrolytic theory is so far satisfactory; if it does not dissolve, we must conclude that the oxygen finds some way of directly attacking the metal.

Dr. Cushman then gives an account of his experiments which he considers demonstrate that Whitney is right in the assertion that iron goes into solution up to a certain maximum concentration in pure water, without the aid of oxygen, carbonic acid or other reacting substances. This point established, it becomes apparent that the rusting of iron is primarily due, not to attack by oxygen, but by hydrogen ions. From the remainder of the pamphlet, which elaborates the argument for the theory of electrolytic corrosion, discusses at length the inhibiting effects of certain substances upon the corrosion of iron, and details Dr. Cushman's brilliant experiments giving ocular demonstration of electrolytic action, we make liberal extracts below. The accompanying plates are remarkable confirmation of Dr. Cushman's conclusions, and constitute in themselves a highly important contribution to the literature of the subject.

Stimulants and Inhibitors of Corrosion.

All substances in solution which contain hydrogen ions, such as acids, stimulate the corrosion of iron. This is also true of salts of strong acids and weak bases, which, though perfectly stable in a dry condition, hydrolyze in solution to an acid reaction; or which, though neutral in fresh solutions, undergo slow decomposition under the action of light, with the formation of acid salts or free acid. With certain exceptions, salts which are perfectly neutral in solution do not prevent oxidation, but appear to aid it by increasing the electrolytic action. All substances which develop hydroxyl ions in solution, such as alkalies or salts of strong bases with weak acids, to a certain extent inhibit, and, if the concentration is high enough, absolutely prohibit the rusting of iron.

Under the electrolytic theory the explanation of the protection afforded by hydroxyl ions is a simple one. Owing to the small dissociation of water, hydrogen ions cannot exist in a solution in which the hydroxyl ions are in excess. As hydrogen ions cannot exist or be locally formed in sufficiently strong alkaline solutions, no attack is made upon the iron, which remains permanently unaltered. If, however, the concentration of the hydroxyl ions is not sufficiently great, electrolysis can go on with an apparent stimulation of the pitting effects similar to that produced by perfectly neutral electrolytes, such as sodium chloride.

Solutions of chromic acid and potassium bichromate inhibit the rusting of iron. In order to determine the concentration necessary to produce complete protection, a number of polished strips of two different samples of steel were immersed in bichromate solutions of increasing concentration, contained in tubes which were left

quite open to the air. There were 12 tubes in each series, ranging by regular dilutions from tenth-normal down to ten-thousandth normal. At the end of two months the last four tubes showed graded rusting with accumulation of ferric hydroxide. No rusting had occurred in any of the solutions above tube No. 8, which contained six-hundred-and-fortieth normal bichromate, a strength corresponding to about 8 parts of the salt in 100,000 parts of water, or about 2 lb. to 3000 gal. Since solutions of bichromate do not hydrolyze with an alkaline reaction, but on the contrary are usually slightly acid, some other explanation must be found for this remarkable phenomenon.

On first thought it would seem a paradox that a strong oxidizing agent should have the effect of preventing the oxidation of iron, and yet this is precisely the case. If, however, the initial cause of rusting is the hydrogen ion, it is possible to believe that under certain conditions oxygen would prove the most effective of all inhibitors. Dunstan, Jowatt and Goulding have claimed that this peculiar action of chromic acid and its salts is due to the fact that they destroy hydrogen peroxide. This explanation is not satisfactory.

Oxygen Retained on the Surface of Iron.

The writer has observed that if a rod or strip of bright iron or steel is immersed for a few hours in a strong (5 to 10 per cent.) solution of potassium bichromate, and is then removed and thoroughly washed, a certain change has been produced on the surface of the metal. The surface may be thoroughly washed and wiped with a clean cloth without disturbing this new surface condition. No visible change has been effected, for the polished surfaces examined under the microscope appear to be untouched. If, however, the polished strips are immersed in water it will be found that rusting is inhibited. An ordinary untreated polished specimen of steel will show rusting in a few minutes when immersed in the ordinary distilled water of the laboratory. Chromated specimens will stand immersion for varying lengths of time before rust appears. In some cases it is a matter of hours, in others of days or even weeks before the inhibiting effect is overcome.

The passivity which iron has acquired can be much more strikingly shown, however, than by the rusting effect produced by air and water. If a piece of polished steel is dipped into a 1 per cent. solution of copper sulphate, a 10-second immersion is sufficient to plate it with a distinctly visible coating of copper which cannot be wiped off. A similar polished strip of steel which has been soaked overnight in a concentrated solution of bichromate and subsequently well washed and wiped will stand from 6 to 10 10-second immersions in 1 per cent. copper sulphate before a permanent coating of copper is deposited. Even a momentary plunging of the metal into the bichromate will induce a certain passivity, but the maximum effect appears to require a more prolonged contact with the solution.

The passivity of iron was discovered by Keir in 1790. Since the phenomenon is produced only by strong oxidizing agents or by galvanic contact when oxygen can separate on the iron, it was explained by Faraday, Wiederman and others as due to a thin oxide film. From the evidence given above, however, it seems that the passivity of iron is better explained as a polarization effect produced by the separation and retention of oxygen on the surface of the metal. If the rusting of iron is due primarily to the action of hydrogen ions, iron in the condition of an oxygen electrode should be more or less protected from electrolytic attack.

Chromic Acid Prevents Solution of Iron.

Reduced to its simplest terms, the following explanation of the rusting and corrosion of iron seems to the writer the only one that is tenable. In order that rust should be formed iron must go into solution and hydrogen must be given off in the presence of oxygen or certain oxidizing agents. This presumes electrolytic action, as every iron ion that appears at a certain spot demands the disappearance of a hydrogen ion at another, with a consequent formation of gaseous hydrogen. The gaseous hydrogen is rarely visible in the process of rusting, owing

to the rather high solubility and great diffusive power of this element. Substances which increase the concentration of hydrogen ions, such as acids and acid salts, stimulate corrosion, while substances which increase the concentration of hydroxyl ions inhibit it. Chromic acid and its salts inhibit corrosion by producing a polarizing or dampening effect which prevents the solution of iron and the separation of hydrogen.

The Demonstration of Electrolytic Action.

Whenever a specimen of iron or steel is immersed in water or a dilute neutral solution of an electrolyte to which a few drops of phenolphthalein indicator had been added, a pink color is developed. If the solution is allowed to stand perfectly quiet it will be noticed that the pink color is confined to certain spots or nodes on the surface. The pink color of the indicator is a proof of the presence of hydroxyl ions and thus indicates the negative poles. Many persons who are interested in the metallurgical problems connected with the iron and steel industry may not be familiar with the modern theory of indicators, and therefore an explanation of the manner in which phenolphthalein shows the presence of hydroxyl ions by the formation of a pink color will not be out of place. Phthalic acid was first prepared by Laurent in 1836 by the oxidation of naphthalene, and was first called naphthalinic acid. It was afterward shown that the compound was not directly related to the naphthalene structure and Laurent changed the name to phthalic acid, the derivatives of which became known later as phthaleins. Phenolphthalein is a product which is formed by the condensation of two molecules of phenol or carboic acid with the anhydride of phthalic acid. It is in its nature so weak an acid that it is not dissociated in solution, and as the molecule is colorless, no color is seen when it is added to a perfectly neutral solution. If, however, an alkali is added the corresponding salt of the weak acid is formed, which immediately dissociates with the formation of a colorless metallic cation and the strongly rose colored organic anion. Thus all hydroxides of basic elements will show the pink color in solution, even when present in only the slightest excess. On this account phenolphthalein is an exceedingly delicate indicator of the presence of hydroxyl ions.

Since phenolphthalein shows only the nodes where solution of iron and subsequent oxidation cannot take place, Prof. W. H. Walker suggested the addition of a trace of potassium ferricyanide to the reacting solution, in order to furnish an indicator for the ferrous ions whose appearance mark the positive poles. If iron goes into solution, ferrous ions must appear, which, with ferricyanide, form the well-known Turnbull's blue compound. Going a step further, Walker suggested stiffening the reagent with gelatin and agar-agar, so as to prevent diffusion and preserve the effects produced. For this combined reagent, which indicates at one and the same time the appearance of hydroxyl and ferrous ions at opposite poles, the writer has suggested for the sake of brevity the name "ferroxyl." The reagent is prepared and used in the following manner: A hot solution of the purest agar-agar or gelatin in distilled water is carefully neutralized with one-hundredth normal potassium hydroxide, using phenolphthalein as the indicator. When exact neutrality has been obtained a few drops of a dilute solution of potassium ferricyanide is added. When a layer of the reagent is poured into a dry Petri dish floating in ice water it should stiffen into a firm jelly in a few minutes. The polished specimens are laid carefully on the jelly and flooded with another layer of the reagent. After the preparation has hardened it should be covered and set away in a cool, dark place. In the course of a few hours the negative and positive zones will begin to develop in red and blue. If the reagent has been properly prepared the color effects are strong and beautiful. In the course of a few days the maximum degree of beauty in the colors is obtained, after which gradual deterioration sets in. The best results obtained by the writer are shown in Figs. 1, 2, 3, 4 and 8 in the accompanying supplement.

The areas which show with sharp outlines in the reproduction are the blue positive nodes, while the pink negative nodes appear with hazy outlines. In the pink

zones, as would naturally be expected, the iron remains quite bright as long as the pink color persists. In the blue zones the iron passes into solution and continually oxidizes, with a resulting formation of rust. Even the purest iron develops the nodes in the ferroxy indicator, but impure and badly segregated metal develops the colors with greater rapidity and with bolder outlines. This result would of course be expected, as in pure iron the formation of poles would be conditioned by a much more delicate equilibrium than in impure iron, where changes in concentration of the dissolved impurities would stimulate the electrolytic effects. Even so-called chemically pure iron contains small quantities of dissolved gases, and it is not improbable that even slight variations in the physical homogeneity of pure iron will occasion the electrolytic effects which are made visible by this delicate reagent.

Local and General Rusting.

It has been noted by a number of investigators that different samples of iron and steel do not rust in the same way when subjected to the action of water and air. While some samples show localized electrolytic action, as indicated by deep pitting, others become covered with a more or less homogeneous coating of hydroxide, which shows little or no tendency to localize in spots or nodes. The question naturally arises: In what respect do these two methods of rust formation differ? A close inspection of Fig. 8 is suggestive if not conclusive of the answer in this respect. The photographic reproduction exhibits an effect which is frequently observed in the ferroxy tests. When the colors first developed, two dark-blue nodes formed at the opposite ends of the test piece, with a large pink area in the center, where for a time the metal remained quite bright. Very shortly, however, the poles changed, and the pink central area disappeared and gave way to a large blue node, which enveloped three-quarters of the test piece, with a small opposed pinkish spot. Again and again a reversal and change of poles took place, and at least five such changes are clearly shown in the photograph. As a result of this action the metal strip was rapidly covered over its entire surface with the same superficial, loosely adherent coating of hydroxide, which is obtained in many cases when certain samples of iron and steel are allowed to rust under a layer of water. It is presumable that as the surface of the metal is eaten into by the solution of the iron at the positive poles, a new condition of equilibrium occurs, resulting in changes and even reversals of the positive and negative nodes. This would indicate that in the case of metals which suffer from local action or pitting the segregation conditions are of a different nature from those which exist in the case of metals which rust more evenly. A rough analogy may be drawn by imagining an imperfect mixture of black and white sand, the respective grains of which may lie in streaks, spots and layers, or may tend to arrange themselves in some more or less uniform relation to each other. The best demonstration that the rusting and corrosion of iron and steel in all its forms is essentially an electrolytic phenomenon is afforded by the fact that it has not as yet been possible to find a specimen of such purity that no trace of positive and negative nodes will be formed in the ferroxy indicator.

Application of the Electrolytic Theory.

We may now apply the electrolytic theory to the actual results obtained in the ordinary rusting of iron. If a section of rolled metal, such as sheet or plate, is immersed in water, if the electrolytic theory is correct, rusting must take place with the establishment of positive and negative spots or areas. At the positive points iron will pass into solution and be rapidly oxidized to the loose colloidal form of ferric hydroxide which is characteristic of rust formed under these conditions. It is a well-known fact that colloidal ferric hydroxide will move or migrate to the negative pole if subjected to electrolysis. We may therefore consider the possibility of two separate effects that may be produced—viz., when a positive center is surrounded by a negative area, and *vice versa*. These two conditions may be graphically

represented by the two circles A and B shown in the accompanying diagram.

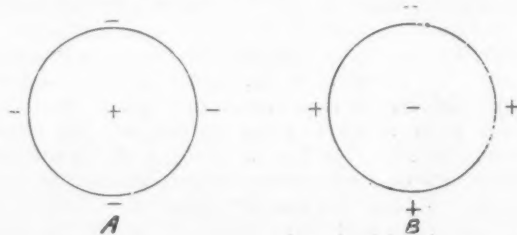


Diagram Illustrating Electrolytic Action on the Surfaces of Iron and Steel.

Now, as rusting proceeds we should expect in the case of A that the ferric hydroxide would be piled up in a crater formation, while the metal is eaten out at the center. In the case of B the effect would be reversed, and while the metal would be attacked in the surrounding area the hydroxide would be piled up in a cone at the center. That this is precisely what is taking place whenever a sheet of metal rusts under water a low power microscope very clearly shows. In Figs. 5, 6 and 9 the writer has succeeded in showing the existence of both the craters and cones as they formed on the surface of a piece of wrought iron boiler plate. In Fig. 5 a typical crater surrounding the point of pitting is shown, while in Fig. 6 an excellent example of the cone appears. Both are photomicrographs magnified about 45 diameters. The source of light was on the right in each case and the shadows indicate the crater and cone formation, which is so clearly discernible under the microscope. Fig. 9 is from photographs of the rusted metal, showing the craters and cones as they appeared with very low magnification.

Fig. 7 shows the surfaces of strips of Bessemer steel, *s*, puddled wrought iron, *z*, and charcoal iron, *c*, prepared in the following manner: The respective samples were turned off in a lathe to a bright, smooth finish; they were then immersed under a thin layer of the ferroxy reagent and allowed to stand quietly for several days. At the end of this time the surfaces were wiped clean. The electrolytic effects, which had been active on all three metals, are very well illustrated. The light portions show the negative areas, where little or no rusting took place, while the dark spots and areas show the special points of attack, with the pitting effects. The etching is not, of course, deep in the case of any of the three samples and should not be understood as showing the relative rate of corrosion of the different types of metal. The specimens simply serve as a demonstration that the rusting in each case has been accompanied by electrolysis.

Fig. 10 is a photographic reproduction of the actual pitting of a boiler tube which failed after 18 months' service in a water tube type of marine boiler. The conclusion that pitting was due to electrolysis seems justified by comparing this view with Fig. 9.

The evidence advanced in the preceding pages appears to the writer to confirm the conclusion that the whole subject of the corrosion of iron is an electro-chemical one, which can be readily explained under the modern theory of solutions. It is an undeniable fact that some irons and steels suffer corrosion very much more rapidly than others, and the underlying causes for these differences constitute one of the important problems of modern metallurgy.

Restraining Electrolysis Restrains Corrosion.

Although the discussions brought forward in this bulletin are mainly theoretical in their nature, it is quite apparent that they also have an indirect practical bearing. Before advance can be made in overcoming the difficulties in the way of manufacturing iron which shall have the maximum resistance to corrosion, as well as the preservation of the metal under the conditions of service, the underlying causes must be thoroughly understood. If we accept the electro-chemical explanation of the corrosion of iron, there can be no doubt that conditions which inhibit electrolytic effects also inhibit corrosion, and *vice versa*. The purer the iron in respect to

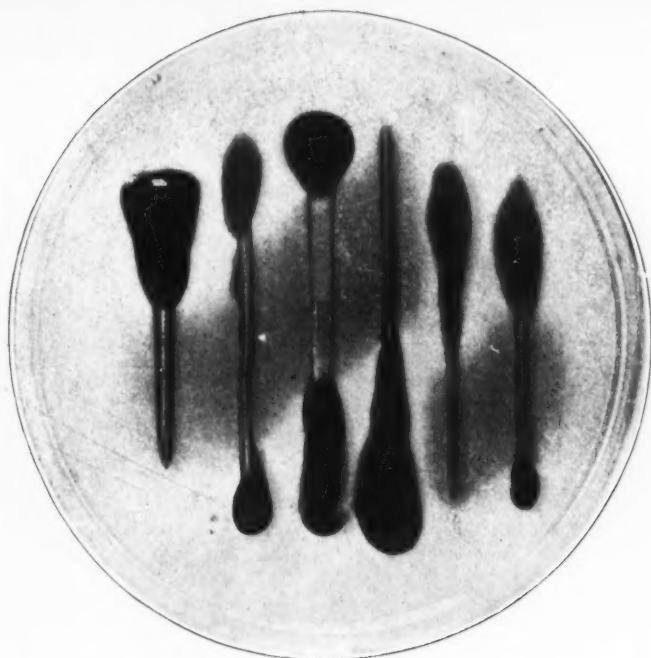


FIG. 1.—IRON AND STEEL NAILS IN FERROXYL REAGENT

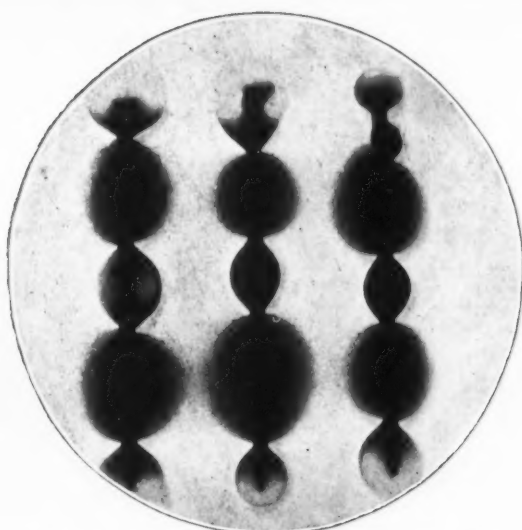


FIG. 2.—STEEL WIRE NAILS IN FERROXYL REAGENT

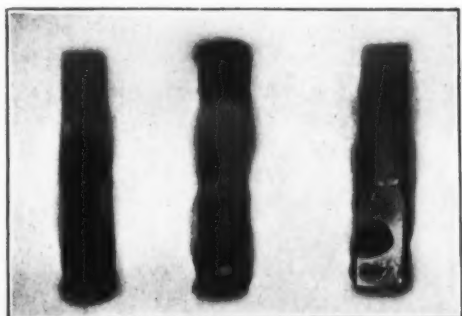


FIG. 3.—WROUGHT IRON, CHARCOAL IRON, AND STEEL IN FERROXYL

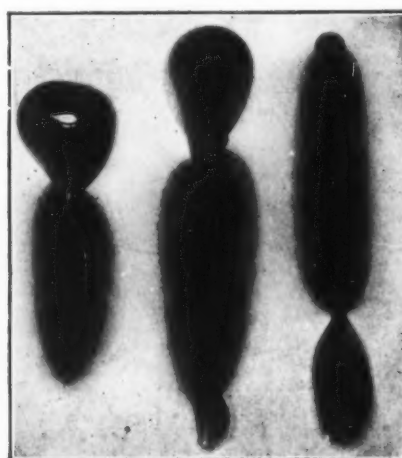


FIG. 4.—STEEL NAILS IN FERROXYL REAGENT

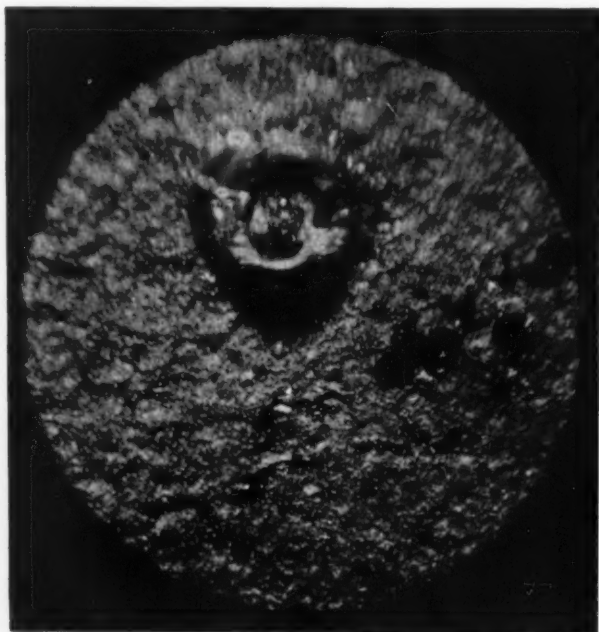


FIG. 5.—FORMATION OF CRATER WITH PITTING EFFECT IN CENTER. (ENLARGED 45 DIAMETERS)

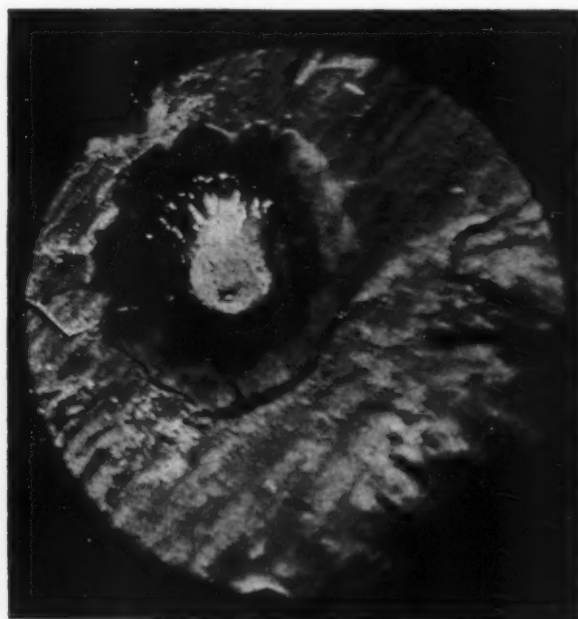


FIG. 6. FORMATION OF CONE WITH PITTING EFFECT IN SURROUNDING AREA. (ENLARGED 45 DIAMETERS.)

THE ELECTROLYTIC CORROSION OF IRON

VIEWS ILLUSTRATING DR. ALLERTON S. CUSHMAN'S EXPERIMENTS

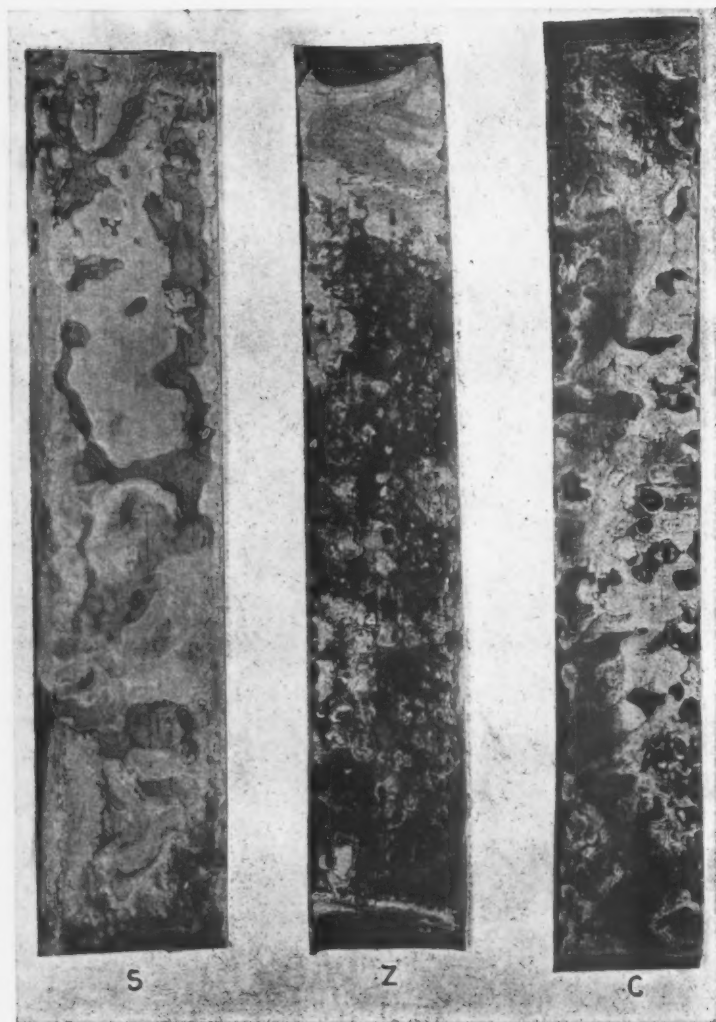


FIG. 7.—ETCHING EFFECT PRODUCED ON POLISHED SURFACES OF IRON AND STEEL BY IMMERSION IN FERROXYL REAGENT. S, BESSEMER STEEL; Z, PUDDLED WROUGHT IRON; C, CHARCOAL IRON



FIG. 8.—STRIP OF STEEL IN FERROXYL REAGENT, SHOWING FREQUENT REVERSAL OF POLES



FIG. 9.—PHOTOGRAPHED RUST SPOTS ON THE SURFACE OF IRON



FIG. 10.—PITMARKS ON THE SURFACE OF A BOILER TUBE

certain other metals which differ electro-chemically from iron, and the more carefully lack of homogeneity and bad segregation are guarded against, the less likely are the electrolytic effects to become serious. These points constitute the essential problems which confront the manufacturer who desires to make a product which shall have a high resistance to corrosion. The user and consumer, however, are interested in the protection of the various types of merchantable iron and steel which are available under market conditions at the present time. In short, protective coatings and palliative methods of treatment are in greater demand to-day than ever before. From the standpoint of the electrolytic theory many suggestions for experiment under the conditions of service present themselves. The fact that hydroxyl ions inhibit the rusting of iron has been made practical use of for a long time past, and it is not unusual to add caustic alkalies to boiler waters for this reason. This, however, frequently causes trouble from foaming, and, as Cribb has shown, if an insufficient amount of alkali is present the pitting effect is accentuated rather than inhibited. This observation is in accord with the theory that the hydroxyl ions must reach a certain concentration, which varies with different conditions, before entire prohibition of the electrolytic effects is obtained.

At concentrations much below those necessary to prohibit electrolysis the action is similar to that obtained by adding a neutral electrolyte to the water—i. e., the electrolytic effects are localized if not stimulated. There should be many cases, however, where the property of alkalis to inhibit corrosion could be made of more practical use than has been done. Whenever iron posts or standards are set directly in the ground, instead of being imbedded in concrete, the liberal use of slaked lime should be beneficial.

Methods of Boiler Protection.

The expedient of using metallic zinc in boilers to overcome the local electrolytic effects in the iron by producing a still greater electrolytic effect at the almost exclusive expense of the more positive zinc is well known and has been in use for a long time. Although the theory on which the use of zinc for this purpose is based is sound, great difficulty has been encountered in maintaining good metallic contacts between sufficiently large surfaces of the two metals under the conditions which maintain in a boiler. From what has been shown in regard to the inhibitive action of the chromates it is not improbable, since such dilute solutions prevent electrolysis and corrosion, that the addition of small quantities of bichromate to boiler waters would be highly efficacious in preventing the rapid pitting which has caused so much trouble. It has lately been reported that steel boiler tubes used on vessels, fitted with turbine engines suffered corrosion to the point of failure in from two to four months' service. This was found to be due to the fact that the steam, containing perhaps volatile acids, impinging on the bronze turbine blade, carried copper into solution and through the condensers into the boiler. Since iron does not change places with copper in dilute solution containing bichromate, it is possible that here again this salt would be found of practical value. That this statement is correct can easily be shown. If a bright piece of iron is immersed in a solution of copper sulphate so dilute as to show only a faint bluish tinge, the iron will nevertheless turn dark from precipitated copper in a very few moments. If now potassium bichromate is added in only just sufficient amount to give a yellowish instead of a bluish tinge to the solution, iron will remain bright and copper will not be deposited.

The experiment has been made by the writer of keeping iron and steel in dilute boiling solutions of bichromate for protracted periods at the same time that a current of air was bubbling through the boiler, and as long as the strength of the solution was equal to or above 1-160 normal no rusting has ever taken place. Since this strength is approximately equivalent to 1 lb. of the salt in 1500 gal. of water, there seems to be no reason why potassium bichromate should not come into use as a boiler protective. The application of the various inhibitors in the priming coats of paints and other protective coverings has already been to some extent made

use of, and it would appear that slightly soluble chromates should be theoretically the best protectives for the first application to iron and steel surfaces.

Corrosion of Wrought Iron and Steel.

A very widespread impression prevails that charcoal iron and puddled wrought iron are more resistant to corrosion than steel manufactured by the Bessemer and open hearth processes. It is by no means certain that this is invariably the case, but it would follow from the electrolytic theory that in order to have the highest resistance to corrosion a metal should either be as free as possible from certain impurities, such as manganese, or should be so homogeneous as not to retain localized positive and negative nodes for a long time without change. Under the first condition iron would seem to have the advantage, but under the second much would depend upon care exercised in manufacture, whatever process was used.

The evidence appears to be conclusive that the corrosion of iron in all its forms is primarily due to hydrogen ions. The ability of various samples to resist the attack of an acid of a standard strength may turn out to bear some relation to resistance to corrosion under service conditions. A great variation in resistance to acid corrosion is shown by different specimens of both iron and steel. An investigation of this subject is being made in connection with the work of Committee U of the American Society for Testing Materials. Carelessly made and poorly segregated metal will be easily attacked, no matter what it may be called or what method was used in its manufacture. As has already been pointed out, there are two lines of advance by which we may hope to meet the difficulties attendant upon rapid corrosion. One is by the manufacture of better metal, and the other is by the use of inhibitors and protective coverings. Although it is true that laboratory tests are frequently unsuccessful in imitating the conditions in service, it nevertheless appears that chromic acid and its salts should under certain circumstances come into use to inhibit extremely rapid corrosion by electrolysis.

Pennsylvania Freight Yard Extensions.

Enormous industrial development in the United States in the last 10 years is shown by the figures just issued by the Pennsylvania Railroad on the capacity of its freight yards in 1897 and 1907. Ten years ago the large yards on that railroad had a capacity of 10,381 cars, while they can now hold 30,121 cars, an increase of nearly 200 per cent.

The facilities for doing the work formerly done by the old Altoona yard have been practically trebled by the addition of the Hollidaysburg yard, as these two yards together now do the work formerly done by the old Altoona yard, whose capacity was 5110. The two yards now have a capacity of 15,000. The Harrisburg yard in 1897 had a capacity of 4422, and this has been increased by large additions, as well as the construction of the Enola yard across the river. The combined capacity of these yards, which do the work formerly done by the Harrisburg yard, is 13,160.

The necessity for the enlargement of these yards and for the construction of new ones can be seen from the fact that the Pennsylvania Railroad hauled 30 per cent. more freight in 1906 than in 1904. The increase in freight car mileage of 30,000,000 shows the ease of movement made possible by the enlarged yards, which permit of rapid work in making up trains and getting them out on the road.

The new turbine Cunarder, the *Lusitania*, will leave her first trip from New York September 21. About 1100 tons of coal a day will be burned. A possible rival is the new North German Lloyd steamer *Kronprinzessin Cecilie*, which exceeded the contract speed of 24 knots on its trial trip recently.

Railroad officials are reported not as pessimistic as they were during May and June. Improved conditions of traffic and business have compelled a change of opinion.

THE IRON AGE

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Features of the Pig Iron Statistics.

The pig iron statistics for the first half of 1907 contrast with those for 1906 in showing an increase in the production of foundry and forge irons. Whereas all the increase in pig iron output in 1906 over 1905—2,314,811 tons—was in steel making irons, foundry and forge irons actually falling off 38,610 tons in 1906 from their total for 1905, more than half the 753,103 tons increase in pig iron production in the first six months of this year, comparison being made with the second half of 1906, was in iron entering into castings and wrought iron. The figures for the last three half-year periods are given in the table below, and in the right hand column the increase in the first half of this year upon the second half of 1906. Bessemer iron includes low phosphorus iron and malleable Bessemer is included in foundry iron:

Pig Iron Production by Classes in Six-Month Periods.—Gross Tons.

	First half of 1906.	Second half of 1906.	First half of 1907.	Increase over sec- ond half of 1906.
Bessemer	6,884,881	6,955,637	7,185,878	230,241
Basic	2,449,275	2,569,399	2,671,136	101,737
Spiegel and ferro..	160,833	139,667	172,675	33,008
Foundry and forge..	3,087,261	3,060,238	3,448,355	388,117
Totals.....	12,582,250	12,724,941	13,478,044	753,103

It appears that while the output of steel making irons increased 364,986 tons, as compared with the second half of 1906, foundry and forge irons gained 388,117 tons. Imports are also interesting in this connection. The supply of domestic foundry iron fell off in the second half of last year, and the import movement automatically increased to take care of an increasing demand for castings. Then domestic production of foundry iron increased in the first half of this year and imports declined, pig iron imports between January 1 and June 30 being 343,219 tons, as compared with 412,190 tons in the second half of 1906. Indications are now that the tense condition of the foundry iron market which has prevailed for the past year will be succeeded by some relaxation. This must be accompanied, moreover, by proper readjustments in raw material values, else producers will find themselves under most uncomfortable pressure from above and below.

We have referred above to the character of the increase in pig iron production in the first six months of 1907. Its geographical aspect is also of interest. New York, Pennsylvania, Ohio and Illinois furnished over 98 per cent. of it, or 740,379 tons out of 753,103 tons. New York, which has been steadily increasing its pig iron output in recent years, all but supplanted Alabama in fourth place in the list of States, with 859,125 tons against 861,-

771 tons. The Southern States—those making pig iron from native ores, and not including Maryland and West Virginia, which draw on outside sources—have been gaining but slowly. Raw material supplies there do not measure up to furnace capacity, largely because labor is neither sufficient nor efficient. While the increase in output of all the furnaces of the country was 6 per cent. in the first half of the year, the increase of Virginia, Kentucky, Tennessee, Alabama, Georgia and Texas was but 1 per cent. over the last half of 1906. Alabama and Virginia produced but 250,590 tons of basic iron, as against 302,593 tons in the preceding six months. Since both States increased their total output, the foundries buying Virginia and Alabama irons evidently benefited at the expense of steel works. But when the new basic open hearth plant at Ensley comes into operation the conditions will be reversed and Alabama blast furnaces will make a new high record in the percentage of their output entering into the production of steel.

Car Service Regulation.

The leading railroads have adopted a new policy in handling the question of car service or demurrage charges. They are filing with the Interstate Commerce Commission, as "tariffs," the rules and schedules of demurrage charges which have been adopted in the various car service bureaus of the country, the filing being done by both the associations and by the railroad companies. Where State legislatures or State railroad commissions have established car service laws or rules, the new tariffs that are filed with the Interstate Commerce Commission contain announcements that they are to govern on all interstate shipments, and State rules are recognized as applying only to local or "intrastate" shipments. There is likely to be considerable litigation over this question. Nearly all carload shipments are interstate, and if the roads can establish in court their claim that the State has no control over cars used for interstate shipments, there is likely to be considerable disappointment in State capitals where car service and reciprocal demurrage laws have been enacted the past year.

The railroads, in raising this issue, have their eyes on New England more than on the State laws that have been enacted in the West. In Connecticut and Vermont State laws require the roads to allow four days for loading or unloading cars, and four days for reconsignment, if the consignee wishes to take advantage of that privilege. In other New England States the roads have allowed the same schedule of free time, but outside of New England the general rule is two days for loading or unloading and one day for disposition or reconsignment. The roads outside of New England are seeking to cut off the four-day privilege of New England industries.

If it were left to the New England roads there would be no change in this custom, which is a great advantage to most industries, especially in providing a regular supply of coal for large plants. At nearly all times of the year there is more carload traffic flowing into New England than going out, so that cars tend to accumulate on New England lines, and they are always well supplied. Last winter, when the great railroad systems between New York and Chicago had less cars on their lines than the number that they own, New England roads had a surplus of 60 per cent. on their lines over the number they own. This fact develops the interest which railroads in Pennsylvania or Ohio have in the question of car service in New England. Of the cars on New England roads on January 1, 1907 (160 per cent. of the num-

ber owned), 90 per cent. (calculated on the number owned) were cars belonging to "foreign" roads.

The outside roads object to investing the money of their stockholders in cars for the use of New England lines, and as an enormous amount of money is involved they will leave nothing undone that will facilitate the return of their property. Their legal advisers say that the road owning a car has the right to dictate the terms under which it shall pass to a "foreign" line, and it may be that this includes the right to say how long it shall be held for unloading and reloading on a "foreign" line.

From one point of view the State has absolute legislative or police power over its industries, and nearly all railroads hold their charters and other privileges from the State. It would seem as though the State may prescribe, as Connecticut and other States have done, the time that an industry or a shipper shall be allowed to load or unload cars, as this is a question of promoting or protecting State industries. But, on the other hand, there are rights of interstate commerce involved. When one State, like Connecticut, lays its hands by law on cars that are used in interstate commerce and detains them, as Connecticut does, in excess of the number of cars owned by Connecticut roads, and shippers in Pennsylvania are forced out of business by the inability of Pennsylvania roads to supply cars or get them back from Connecticut for the use of Pennsylvania shippers, the question may become one of interstate commerce, which is beyond the jurisdiction of the State. The Pennsylvania system, after spending \$37,000,000 in a year and a half for new cars, was short 24,000 cars last winter, having that number less on its lines than were owned by the system; and shippers brought suits against the company for failure to perform its duty as a common carrier.

In view of all these facts, it may not be a wasted precaution if New England manufacturers see that their plants are in shape to handle cars in 48 hr. in case it may become necessary. The railroads have always been successful in the past in carrying out any plan which they can show is for the general good of the country, and they are confident that they can win out in establishing uniform car service rules throughout the United States on interstate shipments.

The Transition in the Iron Trade.

It is now some months since financiers and industrial leaders began to say that some slackening in business would be beneficial. The country's condition was described as that of a patient suffering from congestion and the accompanying fever, and the opinion has been expressed again and again that a rest would restore things to normal and hence would be welcomed. It is not certain that those who urged the rest cure really wanted it or really believed it would be a good thing; it is a fact, however, that the general interpretation put upon the one tangible promise of a slower pace has not been favorable. We refer to the figure representing unfilled orders, which accompanied the quarterly financial statement of the United States Steel Corporation last week. This showed that such orders on June 30 were 7,603,878 tons, as compared with 8,043,858 tons on March 31, 1907, and 8,489,718 tons on December 31, 1906.

It will be noticed that the falling off from the March 31 total is about the same as was announced three months before; yet no such commotion was caused in early May by a similar announcement. The fact that the second drop of 400,000 tons had been given publicity within three months may have been considered reason

for apprehension. But more emphasis was put evidently on the statement which in all the financial columns accompanied the report, namely, that the directors had added the information that July orders this year were 25 to 30 per cent. less than those of July, 1906. Much of the comment of the week has run to the reason for volunteering such a statement at this time. That question is unimportant in comparison with the fact itself, so far as the latter is indicative of a trade recession. But in whatever way the question is answered it is not to be gainsaid that there are quarters in which exact knowledge of industrial conditions as indicated by the iron trade might be a determining influence in the present period of transition. Evidences have been multiplying recently that the supply of jobs and the supply of men are more nearly equal; in a few cases the line has been crossed and we have the condition Mr. Hill predicted some months ago, or more than one man to one job. Whether labor leaders are to conduct their followers into expensive struggles for higher wages and shorter hours under the present slackening tendencies will be determined by considerations which neither employers nor the public can control. However, it is well that if such action is to be taken it be taken with as clear apprehension as can be had of conditions as they are.

The theory is commonly advanced that the way out of the present money scarcity is to curtail business until the supply of money shall become sufficient to permit business to expand again. Yet there is no deliberate attempt to put the theory into practice. It is well known, for instance, that the lack of rail orders in July, due to causes generally understood, was responsible in large part for the falling off in the steel trade last month from the record of July, 1906. Fully 250,000 tons of rail orders were placed in July last year. Presumably the questions pending between the rail mills and the railroads will be settled before many weeks. These are not related directly to the money supply. But when they are settled, the question will come up whether the demand for money simply to keep the machinery of trade moving has fallen off sufficiently to permit of placing rail orders for extensions now in contemplation. A similar question will come up regarding money for cars and locomotives and new railroad shops. Its solution will not depend simply on the release of liquid capital that would result from a slowing of business. The condition precedent to a revival after a recession is such an abundant accumulation of liquid capital as will again permit its conversion into fixed forms.

Returning to the iron trade condition, as gauged by orders on the books: There is certainly no signal of distress in a summer total of such orders, greater than the Steel Corporation ever had on its books at midyear. Moreover, the total of 7,603,878 tons on June 30 is almost identical with the tonnage reported at the opening of last year—namely, 7,605,086 tons, while it is 800,000 tons in excess of that reported June 30, 1906, or one year previous. As has been pointed out in these columns, not enough is known of the method followed in making up these totals to make them the sole basis of an opinion as to business conditions. Other facts have an important bearing. From the time, some months ago, when denials began to be made that any change had appeared in the degree of prosperity of the iron trade, there has been a condition that did not exist before—prosperity instead of asserting itself, as it had done for months, required to be asserted and vouched for, and from that beginning the readjustment has been progressive. It has been demonstrated again that actual business conditions are not fully understood as present conditions, but

only as they are looked back upon and their relation to succeeding events made plain. So it has happened that a falling off in the pace of new orders is held up, as though it had suddenly become significant, while high priced raw materials, unprecedented labor cost and an absorption of money never equaled before have been treated as though they were simply things to theorize about.

It is no new experience that the iron trade has entered upon, and it is a mistaken view that because the high point in accumulated orders has been passed, the readjustment is bound to be drastic. Finished materials have been so conservatively handled that the swing above the price line representing average prosperity has been moderate. Whatever changes come, therefore, will naturally be looked for chiefly in pig iron and raw materials. Thus far no indications appear that they will be radical or long drawn out.

CORRESPONDENCE.

The Classification of Scrap Iron.

To the Editor: The article on classification of scrap iron in *The Iron Age* of July 25 brings to general notice a matter of great importance to manufacturers. We make a grade of charcoal iron blooms, so uniform and satisfactory in quality that we have not received a well fortified complaint since our first two months' operation. (Our output was nearly 7500 tons for year ending July 1.) This reputation was earned through the careful selection of scrap iron and the use of good, sound charcoal (no gas house coke), skilled labor and good equipment.

Sometimes we have a great deal of trouble and unpleasant negotiations, on account of receiving raw material that is not according to specifications. For instance, we specify "new bundled sheet or tin mill scrap," directly from hot rolls, with only a fair proportion of side and end scrap, bundled according to practice that has existed to my knowledge for 25 years—namely, about 3 ft. long.

We sometimes receive as much as 12,000 lb. of other material in one car, such as painted roofing, galvanized corrugated sheets from old buildings, pieces of old smoke stacks, burnt annealing scrap, pickling scrap, greasy waste and a general cleaning up of mud and rubbish from the annealing and pickling departments. Another source of trouble to us is the receipt of cars containing all end scrap and no side scrap. The end scrap has to be sheared before using if shipped separately, but if shipped in proper proportion the knobblers have to double it free of expense to us. The poorest scrap of all is that from sheets made of bushed scrap, drillings, tin cans or any old stuff. It is reworked under such intense heat and so rapidly that the material is brittle. In such cases we have to resell at a loss. If we used it our good reputation would be gone. New Bessemer scrap is soft and mellow, while bushed scrap is hard and dry.

More trouble is bundling. Some mills double scrap once only and sell at a reduced price. This is all right for open hearth work, but the dealer may ship it to us. Charging boxes for open hearth work will hold a bundle 6 ft. long, while our knobbling fires will not take a bundle over 3 ft. long, and consequently we are losers for extra labor in rebundling. The dealer is too busy figuring up his profit of 25 cents per ton, or as much more as he can get, to worry about specifications, and a three-cornered fight results before a settlement is made.

Once we tried a carload of powder can scrap, new from the factory. In the car we found 130 defective powder cans, all filled and sealed. The cans were mashed under one of our steam hammers, and this disclosed that many of them contained mixed cast iron and steel turnings, borings, drillings, shop sweepings, parts of greasy overalls and other kinds of rubbish.

We can take any good, clean, soft Bessemer or open hearth scrap, and by use of good charcoal and our method of working can make charcoal iron that will conform to

exceedingly strict requirements for tensile strength, elongation, mashing and many other tests, but we cannot accomplish such results unless our specifications are respected, and they are so simple that no trouble should follow. The dealers tell us that it is customary to ship the low grade material above enumerated as "new bundled sheet scrap." The sooner the custom is broken up the better for the trade. Uniform quality will result and defective scrap can be shipped in a car by itself to some sash weight foundry.

AMERSE BEARD,

Vice-President and General Manager Pennsylvania Swedish Iron Company.

CHESWICK, PA., July 27, 1907.

The Molders' Convention.

The Iron Molders' Union of North America continued its daily meetings during its twenty-third session at the Continental Hotel, Philadelphia, Pa., throughout the week. The convention will no doubt complete its deliberations the present week, and has during the past few days been getting down to the closing work of the session. A large number of resolutions have been reported from the various committees, and on Monday alone 230 resolutions were acted upon.

The name of the union, to conform with its greater field, was changed from the Iron Molders' Union of North America to the International Molders' Union of North America.

The report of the Insurance Committee presented a plan for the formation of an insurance organization in connection with the union, which was unanimously adopted. The union will issue three policies of \$500, \$1000 and \$2000, respectively, on a straight life plan.

The greater part of Tuesday's sessions was given over to the discussion of the matter of increasing the membership dues, and while it is partly agreed that some advance should be made, the amount had not been decided upon at the time of closing the afternoon session. The election of officers has been deferred until the closing day.

The National Founders' Association Sues a Member.

On the ground that the Youngstown Foundry & Machine Company, Youngstown, Ohio, is attempting to resign from the National Founders' Association without paying its dues, the Youngstown District Committee of the association has begun suit for \$512.34, alleged to be due on regular and special assessments. The plaintiffs are Irving H. Reynolds, W. S. Russell, H. P. Ranney, William Gilbert and R. H. Jeffrey, constituting the committee for the fourth district of the National Founders' Association. In their petition they say that on September 14, 1899, the Youngstown Foundry & Machine Company, applying for membership in the association, pledged itself to protect any of its fellow members who might require its support against any organizations, to endeavor to settle all disputes amicably, and to obey the constitution and by-laws of the association. The plaintiffs say that the defendant retained membership up to and after November 1, 1906. They further say that they have charge of the management of this district, but that when they applied to the defendant for the dues from April to September 30, 1906, amounting to \$126.80, and for special assessments, dated May 31, August 1 and October 1, 1906, they were refused. It is their understanding that the defendant means to resign without paying these sums, and they have accordingly begun suit.

The Lackawanna Steel Company, Buffalo, N. Y., expects to start its new interchangeable mill for rolling small billets and sheet bars on September 1. The building is nearly ready for the installation of equipment. A considerable portion of the output of the new mill will be taken under contract by the Seneca Iron & Steel Company and the Shenandoah Steel Wire Company, new companies which have recently located in the immediate vicinity.

Fuel Testing.

The United States Geological Survey's Plant Near Norfolk, Va.

BY C. T. WILKINSON.

The fuel testing work of the United States Geological Survey should be followed with close interest by engineers. It is important to all power consumers, and this branch of the Government work is undertaken to point out new paths for developing the natural resources of the country by locating, classifying and testing all kinds of available fuel. In Europe, where the fuel resources are now fully known, there has been no need for so complete an organization as this one. Accurately compiled results of the more recent work of this branch will soon be published, and the following particulars of the plant in Virginia will doubtless be of interest:

The plant is on the grounds of the Jamestown Exposition and is housed in a building accommodating boilers, gas producers, engines and a complete equipment for testing purposes.

New apparatus has been added in the

Steam Engineering Division

as follows: A 250-hp. Babcock & Wilcox boiler, with superheater, provided with a Roney stoker; a Jones underfeed stoker, with fan, added to one of the old Heine boilers; two direct current De Laval turbine sets, rated at 300-hp. at 9000-900 rev. per min., and three Green Fuel Economizer Company's induced draft fans.

The method of work planned for this section is to be slightly changed, so that instead of testing a great number of coals, more tests will be made of the same coal. Different sizes of coal and different methods of stoking or feeding, &c., will be employed to determine the most economical performance under different rates of combustion and the best ratios of grate and heating surfaces.

The Babcock & Wilcox boiler will be placed beside the two Heine boilers, which have been brought from the St. Louis plant, and all three will be provided with induced draft apparatus to obtain a wide range of capacity. The Heine boiler, equipped with the Jones stoker, has the usual arrangement for forced draft. The Babcock & Wilcox boiler was installed partly to enable tests to be made of the same fuel with different types of boilers. It is representative of the types employing a perpendicular flow of the gases through the tubes, while the Heine boilers typify the parallel flow types. The Heine boilers have been rebaffled or partitioned, so as to practically double their length by compelling all the heated gases to pass along the entire length of the tubes twice. An additional alternating current turbo-generator set may be installed to supply power for external and exhibition purposes.

The steam engineering division, which has now practically succeeded in isolating the performance of the boiler from that of the boiler and furnace combined, will conduct other tests to still further determine the performance and efficiency of the furnace alone.

Producer Gas Section.

The gas producers are housed outside of the main building, and the gas, immediately on entering the building, passes through the meter and thence to the Westinghouse gas engine, transferred from the St. Louis plant. Some slight changes have been made in this apparatus. For instance, one producer has been provided with a water seal at the base to permit the ashes to be removed without admitting air, and several holes have been bored at different heights to be used for extracting samples of the gas. The purifying apparatus used at St. Louis has been removed (this, it will be remembered, consisted of the usual chamber containing iron filings and wood shavings), since experience indicates that the danger from impurities has been considerably exaggerated. A special steam pipe has been provided to insure a steady water pressure, as the pressure of the supply mains fluctuates considerably.

The gas engine is belted to a 200-kw. Bullock generator brought from St. Louis, which furnishes current to the motors for the apparatus in the building, the machine shop, the briquetting plant, the elevators and the conveyor. Any additional load required is obtained by using a water box resistance, which can be regulated by the switchboard attendant so as to maintain a steady full load value.

The plans of this section include the following determinations: The proper length for a test run, the effect on the size of the coal, the best depth of the fuel bed, the effects of rapid load variations, the maximum returns from different fuels, and the response of a producer plant to sudden demands for power.

Alcohol and Gasoline Engine Section.

A new work of great importance is being undertaken by this section. Its equipment includes two 15-hp. 250 rev. per min. Otto gas engines, two 15-hp. Nash engines, one 2-hp. International Harvester Company's engine, and two John Deere engines, rated at 14 and 18 hp., respectively.

Experiments will be made covering this whole field, but for the present the work will be chiefly examining different carburetters to disclose lines along which more efficient vaporization may be obtained. The other more prominent work is the studying of the kinds of fuels available, and especially the relative merits of gasoline and alcohol, and an investigation of the use of kerosene as fuel for this class of engines—necessitated by the increasing demand for gasoline and the limited supply available.

Coal Distillation and Combustion.

The study of the destructive distillation of coal and its combustion in gas producers, coke ovens and furnaces, especially from the standpoint of physical chemistry, will be undertaken by several divisions.

Briquetting Division.

In this division, which occupies a large room at the end of the building, there is being installed one large additional German briquetting machine, while the previous apparatus of English and American manufacture that was used at St. Louis is installed in the same room. The work of this division will be chiefly making briquettes from various runs of mine coals of the Eastern fields, which will be tested on war vessels under the direction of the steam engineering division.

Other Plans.

The further fuel testing work of the Geological Survey includes tests dealing with the spontaneous combustion of stored coals, in which an effort will be made to simplify the methods for its prevention, while a corps of specialists will be detailed to investigate closely the whole subject of explosions in coal mines, with a view to eliminating danger from this source.

The Engineers' Club of Central Pennsylvania on August 3 paid a visit to the mammoth dam being constructed at McCall's Ferry, Pa., on the Susquehanna River, and inspected the power plant of the York Haven Company on the return trip. The great dam has been under construction for a year at one of the most picturesque points in the Susquehanna Valley, and in a comparatively short time a power plant capable of about 150,000 hp. will be in operation there. On arrival at McCall's Ferry the party was escorted about the work by Chief Engineer Cooper, Vice-President J. W. Millard, Boyd Ehle and J. W. Young, assistant engineers. At York Haven a power plant has been in operation for several years, which now supplies power to part of the Pennsylvania Steel Company's Steelton plant and other local industries. The party was there under the guidance of General Manager E. F. Baker, Chief Engineer W. J. Hunker, H. T. Snyder and W. H. Brownell. This is the third excursion the club has taken this year, the previous ones having been to the ore hills and furnaces in the Lebanon District and to the Middletown Works of the National Tube Company.

The Mesaba Miners' Strike Over.

DULUTH, MINN., August 3, 1907.—While up to a day or two ago it looked as though the miners' strike on the Mesaba could not end without serious trouble somewhere, it is now about settled. The men have quite generally returned to work, the Western Federation is discredited and in bad repute, and the situation is better than for a long time. This is largely due to the policy carried out by President T. F. Cole and associates of the Oliver Iron Mining Company. Of course, the strikers were at all times in the minority, but, like the pig under the gate, they made enough noise to make people think they were very numerous, and they terrorized the great majority of foreigners employed in and around the mines. Though the lodges of the federation may continue their existence in northern Minnesota, they cannot be of effect in the near future, and it will be an uphill campaign to bring them recruits enough again to force an issue. The entire population of the mining region will resist any effort toward organization.

Docks are working steadily with the old men, their strike having collapsed completely, as predicted in this correspondence last week. They went to work with no concessions on the part of the companies, not even that of subsequent arbitration by committees. Doubtless the mining companies will raise dock wages before very long, and will in that way endeavor to maintain the good feeling which seems to prevail at present. With the settlement of the dock strike by the Duluth, Missabe & Northern Railroad all other docks at the head of the lake resumed operations, and the dockmen of lower ranges gave up any idea of going out that they may have entertained. Efforts were made to induce dockmen at Marquette and Escanaba to go out.

Departure of Idle Men Will Be Felt.

During the strike there was a steady outgo of men and, as usual, those leaving were largely good workers and a loss to their communities. For this reason it is difficult to bring things back to the previous status soon, and it may be some weeks until operations will be as heavy and smooth as they were two weeks ago. This will militate against the season's total shipments, and it will be difficult to bring them as large as many now figure. That there will be plenty of ore to go round is assured, of course, but the fleet is bunched and the miners are somewhat scattered, and no industry of the complexity and importance of the mining and transportation of iron ore can jump immediately from complete quiescence to matured activity. July shipments from the head of the lakes showed a loss of 1,375,000 tons from the corresponding period last year, which is about one-half the net loss resulting from the strike during that month. While shipments for August will doubtless exceed those of the same month in 1906, the season's strike loss will not be fully figured out till the close of August, if then.

It is probable that efforts will be made by all big consumers to anticipate their ore requirements more fully than they have for some years. When the Steel Corporation was organized it was understood that its policy was to be the storage of ample reserves of ore at lower lake points, to meet any one of the many possible accidents to the chain of supplies. But the demands of each year grew to such vast proportions, and the totals became so great, that it has been quite impossible to maintain the original programme. To complicate the increase of requirements has come the lowering of the iron content of ores shipped, so that a larger tonnage has been needed each year to make the same amount of pig iron. For these reasons shipments will be maintained at a higher pitch than the market may warrant for some years to come, if possible, in the attempt to provide a balance wheel of reserve ores.

Old Ranges Have Shipped More Heavily Than Before.

While the Mesaba has been so slow old ranges have shipped steadily and more heavily than before; Escanaba in particular has added materially to its usual total. Mining companies have taken advantage of the abundance of ships and are rushing ore out in order that they

may let up later in the year, when the great bulk of tonnage will be wanted for the head of the lakes.

At Negaunee the new Empire mine, which has been under development for a year or more, is beginning shipments, and will try to produce 50,000 tons this year. It is owned by Oglebay, Norton & Co., and produces a siliceous ore. Also at Negaunee the Regent group of the Oliver Company is carrying out an extensive building programme. This will include a change in the size of skips, &c., for hoisting. New dry houses, machine shops, engine houses, &c., are being provided. The Blue mine shaft will be sunk 160 ft. to the 900-ft. level, and will be opened on that level. At the Prince of Wales the shaft will be deepened 460 ft., to a depth of 1070 ft. In both these mines long rock drifts have been started on the present bottom levels to reach ore; one of these drifts will be more than 700 ft. long and the other will be nearly as long.

At Ishpeming the Oliver Company is carrying on extensive improvements at its section 21 mine, consisting of new standard dry and boiler houses, boiler plant, &c. The mine is idle underground, but shipments from its old stocks are under way steadily. These stocks are very large, covering about all the ground available about the shaft. In time a complete electric plant for traming, lighting, &c., will be installed for this and adjacent mines of the company, and foundations for the power house are now in place.

Explorations Active.

Explorations are active on the Menominee and Mesaba and have suffered no curtailment on account of the strike. In the Crystal Falls District of the Menominee more exploration is under way and planned than ever before, and if a piece of property looks at all well it is taken under option or is waiting for drills. Royalties asked and paid have more than doubled in that section during the past three or four years, while some holders are asking five times the prices that were common a short time ago. These latter are usually holding companies which can afford to wait. There are now 21 diamond drills working in Iron County. Of these, eight are at Spring Valley, five at Crystal Falls, three at Amasa, two at Atkinson, two at Iron River and one at Mastodon. More will be working in the region as fast as reliable men can be had to operate them. There is a scarcity of good men for this class of work.

The Baker mine at Iron River is to be put into condition for shipping ore as soon as possible and will make a considerable product this year.

It is stated that the work of Rogers, Brown & Co. on the Cuyuna range is showing some excellent ore. They have recently taken an option on some of the Adams lands south of Rabbit Lake, and are now sinking a shaft. This good ore, however, was not shown in the shaft, which is not yet deep enough, but in drill holes sunk recently, and is said to have run as high as 58 and 60 per cent. iron, high in phosphorus, as the entire range is, but otherwise quite desirable.

Atikokan Ore In Use.

The blast furnace of the Atikokan Iron Company, at Port Arthur, blown in about two weeks ago, is running successfully on 100 per cent. Atikokan ore from the company's own mine west of Port Arthur, and is roasting ores above its own requirements. It will sell ore to the Hamilton Steel & Iron Company and others, and expects to increase its own capacity of 100 tons daily by taking out the extra furnace lining in a short time. The company has a roasting capacity for 500 tons of ore daily, and will run this part of the works to capacity as soon as the mine can be prepared to furnish so much ore daily.

It is reported that the Oliver Iron Mining Company has bought the Stange tract of timber on the north shore of Lake Superior, east of Duluth, for about \$2,000,000. This tract was bought by A. H. Stange of Merrill, Wis., about six years ago for \$800,000, and is well worth now the price said to have been paid, so great has been the advance in timber values in Minnesota. It has been variously estimated at from 110,000,000 to 130,000,000 ft., but for mining purposes will probably total much more. It is the best and almost the last open tract of timber in St. Louis or Lake Counties.

D. E. W.

PERSONAL.

H. P. Ranney, for a number of years superintendent of the foundry and pattern departments of the American Shipbuilding Company, at Cleveland, Ohio, has resigned, and will give his entire attention to the Bettcher Mfg. Company, Cleveland, of which he is president and treasurer. Mr. Ranney has been in the service of the American Shipbuilding Company since 1890.

George F. Gifford, heretofore contracting engineer of Milliken Brothers, Inc., has been appointed by the receivers of the company to the post of chief engineer. Announcement is made of this appointment coincidentally with the decision of the receivers to enter actively into competition for business in the fabrication and construction of steel buildings and bridges.

H. T. Hulst has been appointed chief engineer of the Marquette range iron mines of the United States Steel Corporation, succeeding Andre Formis.

H. F. Ellard, Ironwood, Mich., has resigned as general superintendent of the Cleveland-Cliffs Iron Company on the Gogebic range and will become manager of the Comanche Mining & Smelting Company, Silver City, N. M.

Robert Wuest, who has been acting commissioner of the National Metal Trades Association, with headquarters at Cincinnati, Ohio, since the latter part of 1905, has been elected commissioner to succeed the late William P. Eagan.

Seward Babbitt, for a number of years general sales manager of the Power & Mining Machinery Company, Milwaukee, Wis., has severed his relations with that company, having been elected secretary and general manager of the Lash Steel Process Company, a corporation formed under the laws of Ohio, and the Canadian Lash Steel Process Company, Ltd., a corporation formed in Canada, with offices in the White Building, Buffalo, N. Y.

W. J. Wallis has been elected president of the Youngstown Foundry & Machine Company, Youngstown, Ohio, succeeding Thomas Parrock. At the same election B. G. Parker was made secretary and Frank A. Williams treasurer. The new Board of Directors is composed of A. E. Adams, S. K. Hine, E. Hartzell, W. J. Wallis, F. Andres, F. A. Williams and Thomas Parrock.

Robert W. Goers, Syracuse, N. Y., foreman with the Steam Gauge & Lantern Company for 15 years and with R. E. Dietz Company the past 10 years, has resigned the latter position. He will take a rest of a few months, but expects to become connected with the lantern business again.

G. N. Sweringen, formerly chief clerk to the general superintendent of motive power of the Rock Island system, resigned August 1 to accept the position of manager of sales in the railroad department of the McMaster-Carr Supply Company, 174-176 Lake street, Chicago.

A. Schoonmaker, formerly assistant to the purchasing agent of the American Bridge Company, Pittsburgh, has resigned to accept the position of Western sales manager for the Graham Nut Company, Pittsburgh, with offices at 1132 Commercial National Bank Building, Chicago. R. J. Adams, formerly representative of the Graham Nut Company in the Pittsburgh District, will be his assistant.

H. L. Calhoun has resigned as secretary of the water works and sewer departments on the city commission of Fort Worth, Texas, to accept the position of secretary of the Fort Worth Iron & Steel Mfg. Company.

C. E. Currier, president of the Atlanta Steel Hoop Company, Atlanta Ga., has resigned, finding all his attention needed in his other position as president of the Atlanta National Bank. He has been succeeded by David Woodward, president of the Woodward Lumber Company, and one of the most prominent lumber dealers in Georgia. George Connors, who has held the position of secretary and treasurer, has tendered his resignation, but has not announced his plans.

Wm. J. Harkins, for some time connected with the Pittsburgh sales department of the Lagonda Mfg. Company, Springfield, Ohio, manufacturer of steam special-

ties, has been appointed district manager for the Pittsburgh territory, succeeding Robert Gregory, with offices in the Iron Exchange Building, First avenue and Water street, Pittsburgh.

Henry C. Frick arrived in New York from Europe August 4, after a trip through portions of England, France and Germany.

E. L. Harrison, well known in the machinery trade in New York and vicinity, has accepted a position as salesman with the Frevert Machinery Company, 18 Dey street, New York.

W. P. Snyder, president of the Shenango Furnace Company, Pittsburgh, accompanied by some friends, starts this week for a visit to the ore regions, and will later make a tour of Yellowstone Park, expecting to be absent about three weeks.

William McConway has been elected a director of the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., to succeed P. F. Cobbe, deceased.

Marcell Moucard, who for the last seven years has been chief engineer of the Filer & Stowell Company, Milwaukee, Wis., has resigned to accept the position of superintendent of the Bolinders Engineering Works, Stockholm, Sweden.

E. B. Boye, until recently manager of the Cleveland office of Manning, Maxwell & Moore, has accepted a position with the Warner & Swasey Company, Cleveland, Ohio, as its Chicago representative.

Joseph Wharton of Philadelphia is far from being as ill as the accounts in the daily newspapers of his arrival in this country would lead one to suppose. He walks about every day.

OBITUARY.

JASPER N. HILL died at his home in Anderson, Ind., July 29. He established the Hill Machine Company of that city in 1889, and afterward developed the Hill Tool Company and the Hill Standard Mfg. Company.

DR. EDWIN GILPIN, Deputy Commissioner of Mines of Nova Scotia, died July 10, after a few days' illness. Born in Halifax in 1850, he received the degree of A. M. at King's College, Windsor, N. S., in 1873, his special course being mining, geology and chemistry. In 1879 he was appointed inspector of mines, and in 1886 he became Deputy Commissioner of Works and Mines, a position which he held to the time of his death. The annual reports of the Mines Department were from his pen, and he contributed more than any other man to the study and the development of the mineral resources of Nova Scotia.

The Board of Directors of the LaBelle Iron Works, Steubenville, Ohio, has recommended to the stockholders that the capital stock be increased from \$7,500,000 to \$10,000,000, and that the increase be in the form of a stock dividend of 33-1-3 per cent. The stockholders will act on this recommendation of the board at its meeting in September, and it will probably be adopted. The company is making some large extensions to its plant, among which are another open hearth furnace, sheet and jobbing mills and a plate mill, which are now nearly completed.

After more than half a century of activity, the foundry of the Gordon & Malven Company, Port Jervis, N. Y., made its last casting July 20. The foundry was established in 1852, when Utley Hare, who is still living, engaged in partnership with Benjamin Bull for the purpose of manufacturing stoves and plowshares and doing general jobbing work. The building will be converted into an automobile garage. The Gordon & Malven Company will continue in the business of jobbing hardware, manufacturing tinware, &c.

It is not true that the United States Steel Corporation has decided to build a plant at Sandwich, Canada, opposite Detroit.

Recent Customs Decisions.

Regulations Governing Imports of American Scrap.

The Board of United States General Appraisers has overruled a protest filed by the Carnegie Steel Company claiming free entry for an importation of scrap steel on the ground that it was American scrap returned without having been advanced in value or improved in condition by process of manufacture. Duty was assessed at the rate of \$4 per ton, and it is held by the board that this classification must stand because of the failure of the importing company to secure the necessary declaration from the foreign exporter. In his decision, written for the customs tribunal, General Appraiser Fischer says in part:

The declarations of the foreign exporter, as required by the regulations, were never offered to the collector, nor was a bond given or waived for their production. They are now offered to this board, and we are clearly of the opinion that they should have been filed with the collector at the time of making entry, or a bond given for their production, and that they came too late. An inspection of the declarations shows that they were sworn to 23 days and more after the entry for consumption, and from an examination of the record it would also appear that the oath on entry of domestic merchandise returned in the case of entry No. 1275 was verified on June 10, 1906, more than seven months after the entry. We hold that the regulations have not been complied with, and, inasmuch as it has been repeatedly held that compliance with such regulations is a condition precedent to the right of free entry in cases where the provisions of the statute expressly empower the Secretary of the Treasury to make such regulations, the protest before us must be overruled and the steel scrap in question held dutiable as assessed.

Platinum Scrap.

It has been decided by the lower customs tribunal that platinum scrap is entitled to free entry under the provision in the Dingley tariff for unmanufactured platinum. The S. S. White Dental Mfg. Company, which imported the merchandise, objected to the collector's action in levying duty at 45 per cent. ad valorem under the provision of manufactures of metal. The testimony placed before the board was to the effect that the merchandise is fit only for remanufacture. It was also shown that the platinum scrap consisted of worn out pieces of electric switchboards, the pieces and points being clipped and broken from articles worn out and useless. Under these circumstances the collector is reversed and the protest sustained.

Duty on Agitators.

The board has reached a decision unfavorable to the contention of O. G. Hempstead & Co., who objected to the classification imposed by customs officials at Philadelphia on enameled machines described as "agitators." Duty was assessed at 45 per cent., whereas the importers alleged the proper rate to be 40 per cent. as enameled ironware. The board finds that the importations consist of complete machines, and that, besides the enameled bowls, there are fittings and motive parts of steel and iron. The enameled part of the machine is said to be the least expensive portion of the apparatus. It is held that there was no error in the return made by the collector, the decision holding the machines properly dutiable as entireties at 45 per cent.

Cold Rolled Steel Strips.

The board has sustained protests filed by the Crucible Steel Company of America, the Washburn Wire Company, New York, and Edgar T. Ward & Sons, Boston, regarding the classification to stand on importations of cold rolled steel strips. It was decided that the additional duty exacted by the collectors is erroneous. Protests by the successors of Roses & Co., San Juan, and Thomas Butler & Co., Boston, have been overruled, and a claim by John D. Gluck & Son, New York, sustained.

Corundum Classed as Ground Emery.

The United States Circuit Court for the District of Vermont has handed down a decision in the case of F. W. Myers & Co. *vs.* the United States, affirming the action of the Board of General Appraisers in assessing an importation of corundum as ground emery. The merchandise consisted of the corundum ore ground or crushed into fine grains, and on this account the import-

ers insisted that it be admitted free of duty under the tariff provision for sand. The Circuit Court holds the contention of the importers to be without merit.

New Publications.

The Mineral Industry During 1906. Edited by W. R. Ingalls. Published by the Hill Publishing Company, New York.

The fifteenth volume of "The Mineral Industry" has been issued somewhat earlier than in former years, a fact which will make it all the more welcome to those who have learned to highly value it as a book of reference. The reviews of the economic, commercial and technical development of all the useful minerals are up to date, often even newsy, which is saying much for a book; they are written in the majority of instances by experts in daily touch with the various fields of industry, and they reflect tendencies accurately and well. In these respects "The Mineral Industry" has established a well earned reputation, but it seems to us a deplorable waste of energy that its editors continue to collect the statistics of production, for which so complete an organization exists as the division of mineral statistics of the United States Geological Survey. In many branches of the mining and metallurgical industries some of them, like coal and iron ore, of leading importance, the statistics are not even original.

American Railways as Investments. By Carl Snyder. Published by the Moody Corporation, New York.

In spite of the hysterical assertions of demagogues and yellow writers that the rich are growing richer and the poor poorer, there is in this country an enormous army of men of moderate means and of comfortable fortune, to whose ranks there are astonishingly large accessions every year. The intelligent investment of funds is a problem which is facing a greater number of people than the majority have any conception of. It is a matter which close observation will readily reveal that a larger and larger percentage of investors are less inclined to be speculative, are less inclined to rely upon casual advice, and are depending more upon study of general conditions and upon the elements which surround specific undertakings. When compared with former days, public enterprises and corporations have progressed wonderfully in the direction of publicity, and that alone is a reflection of the tendency to which we allude. But the investor must know how to interpret and analyze the increasing mass of data which are available to him, and that is what Mr. Snyder teaches them in dealing with the greatest single outlet for investments—the railroads. He takes up practically every system of any importance in this country, traces its history, goes over its record and judges its merits from the standpoint of a conservative investor. It is an admirable work—clean, concise, judicious and fair—and cannot be too highly recommended, not alone to those who are intending purchasers of American railroad securities, but also those who are now holders of them.

The recently organized Sons of Vulcan, composed of puddlers who have left the Amalgamated Association, has succeeded in having a number of the larger bar iron mills in the West sign its scale, among which are the following: A. M. Byers & Co., Inc., Zug Iron & Steel Company, Brown & Co., Inc., Pittsburgh Forge & Iron Company, Lockhart Iron & Steel Company and Crucible Steel Company of America, all of Pittsburgh. The Sheffield Rolling Mill Company, Sheffield, Ala., and Wheeling Steel & Iron Company, Wheeling, W. Va., have also signed this scale.

As the result of a patent suit which the Westinghouse Electric & Mfg. Company instituted against the Wagner Electric Mfg. Company, St. Louis, the master has awarded damages to the former amounting to \$132,433.35. The case involved a patent on Westinghouse oil cooled transformers.

Trade Publications.

Structural Work.—Des Moines Bridge & Iron Works, Tuttle and Ninth streets, Des Moines, Iowa. Catalogue. Pertains to the line of work engaged in, which includes the building of bridges, water towers, standpipes, railroad water supply equipment, turntables, roof trusses and the supplying of structural iron and steel for all kinds of buildings. Illustrations show examples of work which has been done and several pages of useful information are appended.

Fan Motors and Fans.—Emerson Electric Mfg. Company, St. Louis, Mo. Three pamphlets. No. 4460 deals with Emerson fans for alternating current of low and high frequency, made in desk, wall, ceiling and column types, and motor driven exhaust fans for alternating current. No. 4470 pertains to Trojan alternating current fan motors, also made in four types, and No. 4490 to Emerson desk fans for direct current, made in 12 and 16 in. sizes. Price-lists of repair parts, telegraphic code and tables of capacities and sizes are contained in these pamphlets.

Metal Decorations.—Kinnear & Gager Company, Columbus, Ohio. Booklet E. Devoted to interior decorations in metal, giving illustrations of Kinnear lock-joint steel ceiling, side wall and wainscoting, lock joint metal tiling, and lap and slip joint cornices. Dimensions and prices are given.

Pipe Threading Machinery.—D. Saunders' Sons, Inc., Atherton street, Yonkers, N. Y. Catalogue. Size 6 $\frac{3}{4}$ x 10 $\frac{1}{4}$ in.; pages 131. This supersedes previous editions and gives illustrations, descriptions and prices of pipe cutting and threading machines, bolt threading and nut tapping attachments, chucks, dies, die stocks, drills, pipe cutters, ratchets, tapping and drilling machines, taps and reamers, tongs, vises and wrenches. The book also includes an index and some useful information.

Pyrometers.—H. L. Dixon Company, Pittsburgh, Pa. Circular. Refers to Price's Perfect pyrometer for measuring temperatures as high as 3000 degrees F., and calls attention to the special advantages claimed for it.

Reinforced Concrete.—Expanded Metal & Corrugated Bar Company, St. Louis, Mo. Bulletin No. 1. Contains a paper read before the Western Society of Engineers, entitled "Tests of Bond Between Concrete and Steel," by T. L. Condon, including a report of tests made at Lewis Institute, Chicago, by Prof. C. E. DePuy.

Packings.—United States Metallic Packing Company, 429 North Thirteenth street, Philadelphia, Pa. Pamphlet. Relates to metallic packings for piston rods and valve stems of stationary and marine engines, which are claimed to be efficient, economical and satisfactory in every way.

Countershafts.—Mossberg Wrench Company, Central Falls, R. I. Circulars. These deal with "Sim-Pull" countershafts and "Multi-Pull" belt shifters (described in *The Iron Age*, April 12, 1906), which by alternate pulls on a pendent cord stop or start the machines which they are driving; also with sheet metal stampings, and the standard model, style C Mossberg wrench.

Seamless Steel Work.—Nortmann-Duffke Foundry Company, Twenty-sixth street and Layton avenue, Milwaukee, Wis. Catalogue A. Issued by the company's pressed steel department, showing examples of work done, such as reservoirs, soda fountain shells, carbonator shells, domes, cylinders, discharge valves, ordnance, tanks, &c., and also mentions other lines engaged in—cold drawn seamless steel work; pressed, deep stamped and drawn steel, brass or copper specialties; steel castings; gray iron castings, and electroplating.

Concrete Block Machines.—Johnson Concrete Machine Company, Sioux City, Iowa. Pamphlet. Pertains to the Warren concrete block machine, capable of molding blocks of any size up to 8 in. high, 9 in. wide and 24 in. long. Molds and plates are also furnished for a 4 x 9 x 24 in. block in rock and plain face. The descriptive matter deals with the operation, construction, special features and equipment of the machines, and also with directions and cost of making Warren blocks.

Industrial Cars.—Continental Car & Equipment Company, Highland Park, Louisville, Ky. Three pamphlets. These call attention to the company's line of Continental dump and plantation cars, including two-way dump, cane, flat, ballast, gondola, logging and mine cars. Illustrations are given of these cars, and also some testimonial letters.

Mine Equipment.—Wellman-Seaver-Morgan Company, Cleveland, Ohio. Circular No. CA-3. Size 6 x 9 in.; pages 40. Illustrates and describes a line of mine buckets, cages, ore cars, chairs or landing dogs, cradles or tipplers, safety detaching hooks, sheaves and skips for inclined and vertical shafts. Illustrations are also given of some mining, milling, smelting and power machinery.

Electric Wire and Cables.—Standard Underground Cable Company, Westinghouse Building, Pittsburgh, Pa. Handbook No. XVII. Size 3 $\frac{3}{4}$ x 7 $\frac{1}{4}$ in.; pages 288. Cloth binding. This handbook of price-lists, telegraph code and useful information relates to bare and insulated wire and cables for the conducting

of electric current and was compiled by Joseph W. Marsh. It is of convenient desk or pocket size, and is so replete with valuable data as to be an important accession to the electrical engineer's reference library.

Steam Boiler Economy.—Vulcan Soot Cleaner Company, Du Bois, Pa. Booklet. Size 6 x 9 in.; pages 32. Deals with economical steam production, explaining the ways of solving boiler room difficulties by the use of the company's methods and apparatus for eliminating waste in operating water tube and return tubular boilers.

Generator Sets.—B. F. Sturtevant Company, Hyde Park, Mass. Bulletin No. 143 of the Sturtevant engineering series. Deals with generating sets with horizontal engines of the HCI center crank type. Photographs show these sets, and a table gives dimensions for convenience in making preliminary layouts of installations.

Gas Engines.—Charter Gas Engine Company, Sterling, Ill. Folder. Describes a line of gas engines adapted to various kinds of work; several styles of pumping engines, including those with separate gear and others in combined self-contained form are shown. Belt drive and direct connected electric sets are also illustrated, as well as outfits for agricultural service, mounted on steel frame and trucks with all accessories complete. The folder is conveniently arranged and is of a size that can be easily carried in the pocket.

Centrifugal Pumps.—R. D. Wood & Co., Philadelphia, Pa. Catalogue. Size 6 x 9 in.; pages 35. Deals with centrifugal pumps for water works and high pressure water service, made in horizontal and vertical types and in various sizes. It is emphasized that these pumps are particularly adapted for all purposes where efficiency, durability and accurate design and construction are essentials. Results of Government and other tests are given, and illustrations show the pumps, some installations of complete pumping equipments, and the pumps under tests, including the Philadelphia high pressure fire service underwriters' test.

Pumps.—Allentown Rolling Mills, Allentown, Pa. Two bulletins. No. 11 is devoted to the Aldrich electric boiler feed pump, giving its details of construction and range of operation, and No. 12 pertains to the Aldrich electric sinking and recovery pump, triplex track pump and horizontal triplex station pump.

Elevator Air Cushions.—Safety Air-Cushion Company, 31 Broadway, New York. Pamphlet. The object of this pamphlet is to give evidence of the reliability of the safety air cushion to prevent the loss of life or injury to the passengers in a falling elevator car. Illustrations are given of buildings where these air cushions have been installed, and results of several tests are included.

Conveying Machinery.—Jeffrey Mfg. Company, Columbus, Ohio. Catalogue No. 57 B. Size 6 x 9 in.; pages 72. Concerns Jeffrey conveying machinery for sawmills, lumber mills and woodworking industries. The illustrations included are reproduced from photographs taken of the machinery in operation, and demonstrate the numberless industries for which elevating and conveying machinery is adapted. Several pages are devoted to revolving and special screens; barrel and package arm carriers; drag, elevating, conveying and transfer chains; patented cable conveyor; adjustable cable sprocket wheel, and log jacks.

Foundry Specialties.—J. W. Paxson Company, Philadelphia, Pa. Bulletins and circulars. No. 12 deals with sifting and grinding machinery, including electrically driven magnetic separators; pneumatic and belt driven riddles and sifters; grinders, &c. Bulletin No. 16 relates to the "Outerbridge" silicon alloy for softening, strengthening and cleaning cast iron. Four circulars refer respectively to the Paxson-Colliau cupola; the Peerless Jorgensen clamps; Paxson linings for cupolas, stacks, furnaces and ladles, and the Excelsior blacking mixer.

Machine Tools.—Gisholt Machine Company, Madison, Wis. Catalogue and pages for insertion in loose leaf catalogue. The catalogue gives an illustrated description of the Gisholt American type semiautomatic turret lathe, a machine adapted for finishing such work as gear blanks, cylinder heads, flywheels, pulleys, &c., of diameter up to full swing of the machine. The lathe is powerful and massive in design, and is easily controlled and operated. Pages 69 and 70 of the loose leaf catalogue refer to the finishing of gas engine cylinders. Pages 71 and 72 deal with the finishing of flywheels in one operation. Pages 73 and 74 illustrate and describe the Gisholt 30-in. boring and turning mill with screw cutting attachment, and the 36-in. mill. Pages 75 and 76 relate to the methods employed in finishing gas engine pistons and rings, and pages 77 and 78 refer to the finishing of automobile cylinders and to the advantages of Gisholt lathes in small shops.

Steel Sheet Piling.—Carnegie Steel Company, Pittsburgh, Pa. Pamphlet. Illustrates and describes at some length the United States steel sheet piling and the Friestedt interlocking channel bar piling. These are recommended as ideal in the construction of river and harbor protection, land reclamation projects, dams, docks, wharves, coffer-dams and foundations of all kinds. Tables of dimensions and tests of important installations are included.

July Pig Iron Output.

The Month's Total, 2,259,682 Tons.

Active Blast Furnace Capacity Reduced.

While July, with 31 days, gained slightly upon the pig iron output of June, the rate of production slackened in July, and at the beginning of August the active capacity was less than on July 1. Many furnaces did not come up in July to their average daily rate for June; furthermore, the furnaces blown out last month were of considerably larger average capacity than those which blew in, even though there was a net gain of two in the number active. The production of the coke and anthracite furnaces in July was 2,259,682 tons, or at the rate of 72,893 tons a day, against a total of 2,234,575 tons, and a daily rate of 74,486 tons in June. The weekly capacity of furnaces active August 1, figured on the basis of performance in July and with allowance for furnaces going in in the past month, was 514,121 tons, against 528,170 tons July 1. The steel works furnaces actually produced less iron in July than in June, even with the extra day, the records being 1,452,557 tons and 1,457,230 tons, respectively.

We give below the production of the coke and anthracite furnaces in July, and the figures for the four months preceding:

	March. (31 days)	April. (30 days)	May. (31 days)	June. (30 days)	July. (31 days)
New York....	151,142	142,241	145,694	141,044	155,658
New Jersey...	36,470	30,715	30,814	32,360	34,633
Lehigh Valley.	60,754	63,926	70,540	66,097	61,854
Schuylkill Val.	61,601	59,670	64,069	57,184	60,035
Lower Susquehanna and Lebanon Val.	62,946	67,665	77,274	67,916	61,279
Pittsburgh Dis.	511,637	530,527	537,088	544,247	534,668
Shenango Val.	172,748	175,441	156,103	157,975	167,319
West. Penn....	121,948	129,079	133,720	133,935	129,887
Md., Va., and Kentucky...	93,080	96,210	99,461	89,028	86,496
Wheeling Dis.	97,158	118,747	122,666	105,479	108,659
Mahoning Val.	179,001	177,425	191,473	178,731	172,704
Central and North. Ohio.	185,598	168,537	158,394	169,830	179,987
Hocking Valley and Hanging Rock.....	33,792	28,677	31,338	35,365	36,250
Ill., Mich., Minn., Wis., Mo. and Colo.	278,655	252,714	291,789	287,633	293,817
Alabama.....	142,281	142,174	151,454	132,630	138,758
Tennessee, Georgia and Texas.....	37,646	35,494	33,628	35,121	37,678
Totals.....	2,226,457	2,219,242	2,295,505	2,234,575	2,259,682

Production of Steel Companies.—Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Republic, Jones & Laughlin, La Belle, Bethlehem, Calumet and Colorado companies show the following totals of products month by month. We give separately a statement of the output of spiegeleisen and ferromanganese, which is included for each month in the total production:

	—Fig.—Total production.—					Spiegeleisen and ferromanganese.	
	1905.	1906.	1907.	1906.	1907.	1906.	1907.
January.....	1,129,042	1,358,015	1,406,397	26,305	21,477		
February.....	1,027,937	1,226,760	1,317,923	26,988	19,444		
March.....	1,232,255	1,400,395	1,424,827	23,595	31,091		
April.....	1,222,710	1,333,591	1,446,788	28,054	26,527		
May.....	1,287,438	1,372,423	1,470,080	29,447	28,822		
June.....	1,149,404	1,293,437	1,457,230	22,737	30,942		
July.....	1,114,409	1,323,391	1,452,557	20,153	25,343		
August.....	1,186,050	1,237,485		18,327			
September.....	1,262,033	1,264,380		24,078			
October.....	1,370,960	1,452,200		23,517			
November.....	1,334,644	1,411,350		29,119			
December.....	1,356,962	1,445,528		21,707			

The list of furnaces blowing out in July includes that of the Detroit Iron & Steel Company on Zug Island, Edgar Thomson K and No. 1 Clairton in Allegheny County, Bellefonte and one Cambria in western Pennsylvania, one Colebrook in the Lebanon Valley, Big Stone Gap in

Virginia, Joliet No. 2 and South Works No. 2 of the Illinois Steel Company, and one Etowah in Alabama.

The number of furnaces in the Pittsburgh District was increased to 47 by the blowing in of Carrie No. 7 on August 1. In July there were blown in after repairs the following: Northern, at Port Henry, N. Y., one Allentown Rolling Mills stack and one Hokendauqua in the Lehigh Valley, Radford-Crane in Virginia, No. 4 Mingo in the Wheeling District, Furnace A at Mayville, Wis., one Allens Creek in Tennessee and Rising Fawn in Georgia.

The table below gives the weekly capacity of coke and anthracite furnaces in blast August 1 and July 1:

Location of furnaces.	Total number of stacks.	—August 1.—		—July 1.—	
		Number in blast.	Capacity per week.	Number in blast.	Capacity per week.
New York:					
Buffalo.....	14	14	30,733	14	30,812
Other New York....	10	5	5,114	4	4,229
New Jersey.....	8	7	7,719	7	7,421
Spiegel.....	2	2	156	2	129
Pennsylvania:					
Lehigh Valley.....	25	20	13,041	18	13,157
Spiegel.....	3	3	924	3	927
Schuylkill Valley....	14	13	12,768	13	12,526
Spiegel.....	1	1	791	1	817
Low. Susquehanna.	8	6	6,640	6	7,555
Spiegel.....	1	1	692	1	661
Lebanon Valley....	10	9	6,510	10	7,630
Pittsburgh Dist....	44	42	118,950	42	121,317
Spiegel.....	3	3	3,157	3	3,339
Shenango Valley....	20	20	37,804	20	37,800
Western Penn....	26	20	28,861	22	32,285
Maryland.....	4	4	7,721	4	7,945
Wheeling Dist.....	14	14	26,435	13	25,902
Ohio:					
Mahoning Valley....	18	18	38,997	18	41,370
Central and North. and Michigan....	21	20	41,093	21	42,538
Hocking Valley and Hanging Rock....	12	12	8,183	12	8,252
Illinois.....	23	21	46,536	23	51,381
Spiegel.....	1	1	801	1	922
Minnesota.....	1	1	1,218	1	1,295
Wisconsin.....	6	6	5,185	5	4,971
Missouri.....	1	1	705	1	772
Colorado.....	6	6	9,754	5	8,569
Spiegel.....	0	0	0	1	413
The South:					
Virginia.....	23	16	9,908	16	10,419
Kentucky.....	7	4	2,401	4	2,327
Alabama.....	46	31	32,532	30	32,347
Tennessee.....	18	14	7,140	13	7,358
Georgia and Texas.	3	3	1,652	2	784
Totals.....	393	338	514,121	336	528,170

The active weekly capacity in coke and anthracite iron has shown the following fluctuations since January 1, 1903:

	Capacity per week.		Capacity per week.
August 1.....	514,121	April 1.....	439,564
July 1.....	528,170	March 1.....	403,157
June 1.....	523,220	February 1.....	405,792
May 1.....	524,538	January 1, 1905.....	377,879
April 1.....	497,456	December 1, 1904.....	357,846
March 1.....	511,035	November 1.....	334,249
February 1.....	492,359	October 1.....	319,249
January 1, 1907.....	507,397	September 1.....	291,573
December 1, 1906.....	513,860	August 1.....	246,092
November 1.....	500,580	July 1.....	272,301
October 1.....	469,665	June 1.....	336,107
September 1.....	441,426	May 1.....	368,244
August 1.....	449,908	April 1.....	337,257
July 1.....	460,570	March 1.....	308,751
June 1.....	472,622	February 1.....	273,692
May 1.....	484,031	January 1, 1904.....	185,636
April 1.....	484,240	December 1, 1903.....	244,156
March 1.....	479,737	November 1.....	273,715
February 1.....	482,156	October 1.....	353,142
January 1, 1906.....	463,673	September 1.....	360,197
December 1, 1905.....	475,814	August 1.....	353,681
November 1.....	460,449	July 1.....	384,825
October 1.....	445,468	June 1.....	388,178
September 1.....	412,563	May 1.....	373,496
August 1.....	410,088	April 1.....	386,215
July 1.....	408,617	March 1.....	347,424
June 1.....	443,092	February 1.....	335,239
May 1.....	452,031	January 1, 1903.....	346,073

The U. S. Hame Company, Buffalo, is completing a two-story brick addition, 50 x 150 ft., to its plant, which will be used for the iron hame department. A brass foundry is also being added.

NEWS OF THE WORKS.

Iron and Steel.

The Dominion Iron & Steel Company, Sydney, Nova Scotia, has been relining in the past few weeks one of its four blast furnaces, and it was expected to go in in the first week in August.

The blast furnace of the Londonderry Iron & Mining Company, Ltd., Londonderry, Nova Scotia, is out of blast for relining and will probably resume about September 1.

The furnace of the Nova Scotia Steel & Coal Company, Ltd., at Ferrona, Nova Scotia, has been dismantled after an idleness of two years.

John McDougall & Co., Montreal, Que., have been rebuilding their Grantham charcoal furnace, at Drummondville, Que., and it will be ready for blast about October 1.

The furnace of the Deseronto Iron Company, Ltd., Deseronto, Canada, which has not been operated this year, is now being relined and will go in blast this month. Heretofore charcoal iron has been made, but Connellsville coke will now be used.

The Hamilton Steel & Iron Company, Ltd., Hamilton, Ont., expects to have its new blast furnace, which has been under construction for some time, in readiness for operation early in September.

Paducah Furnace, Paducah, Ky., which has been idle since 1903, has been dismantled. The Princess Iron Company, which purchased it, may use the equipment in erecting a new furnace or to increase the capacity of its furnace at Glen Wilton, Va.

The Kittanning Iron & Steel Mfg. Company, Kittanning, Pa., will abandon the present Rebecca Furnace as soon as its new furnace, now nearing completion, is ready.

The blast furnace of the Northern Iron Company, Port Henry, N. Y., was blown in July 19 after relining.

The No. 1 furnace of the Buffalo & Susquehanna Iron Company, Buffalo, N. Y., was blown in July 1.

The No. 2 blast furnace of the Allentown Rolling Mills, Allentown, Pa., was blown in July 18 after repairs.

The blast furnace of the Bellefonte Furnace Company, Bellefonte, Pa., was blown out for relining July 25. It will resume in the latter part of August.

The Virginia Iron, Coal & Coke Company's Radford-Crane furnace, Radford, Va., which has been under reconstruction since December, 1905, was blown in July 19.

South Works Furnace No. 2 of the Illinois Steel Company, South Chicago, Ill., was blown out July 10. At Joliet, Ill., the No. 2 furnace of the same company was blown out July 15.

The furnace of the Southern Steel Company at Rising Fawn, Ga., which has been out of blast since November 15, 1906, was blown in July 10.

Furnace A of the Northwestern Iron Company, Mayville, Wis., which went out of blast for repairs March 18, was blown in July 14.

The plant of the Seneca Iron & Steel Company, Buffalo, N. Y., is rapidly nearing completion. All the machinery is on the ground and much of it installed, and it is expected manufacturing will be commenced the first week in September.

The courts have set August 27 as the date for the sale of the property of the United Sheet & Tin Plate Company, which is in litigation. The company has four plants, one at Marietta, Newcomerstown, Newark and Byesville, Ohio. Ralph Westfall of Columbus is one of the receivers. A movement, it is understood, is on foot among the bondholders to buy the property in and reorganize the company. It is expected that such a move will be made at an early date.

The furnace of the Union Iron & Steel Company at Big Stone Gap, Va., was blown out for relining July 2 and started up again August 3.

General Machinery.

The Davenport Locomotive Works, Davenport, Iowa, builder of light locomotives, has completed plans for a new foundry building, which will probably be built this year. Plans have also been prepared for an erecting and machine shop, the erection of which will be deferred until the requirements of the business make this addition necessary. It is the purpose of the company in preparing plans thus in advance to be ready for prompt action when further extension is needed. The company's factory site comprises a tract of more than 30 acres, of which but a small portion is as yet occupied. This fact has no doubt led to exaggerated statements of contemplated improvements, which will be conservatively gauged to meet requirements.

Work has been begun on the erection of a new plant by the Modern Machine Company, Belleville, Ill., for the manufacture of embossing machines and presses.

The Acme Machine Company, Delphi, Ind., has been incorporated with a capital stock of \$5000, to manufacture machinery and do a general machine shop business.

The Hoerman Bros. Mfg. Company, Washington, Kan., manufacturer of pumps and windmills, and general iron foundry

work, has sold its plant to W. H. Guthrie, Garden City, Kan., who is contemplating moving it to the latter point. The principal output is a windmill, patents for which are still owned by the Hoerman Bros. Mfg. Company. The contemplated removal hinges upon the acceptance of a proposition submitted to the Industrial Club of Garden City. If negotiations now in progress are concluded a well equipped machine shop and foundry will be added to its industries.

The C. P. Young Engineering & Supply Company, Ltd., New Orleans, La., has leased the lower floor of the building at Baronne and Lafayette streets, which it is fitting up for general machine work. The company will also carry a full line of machinery and mill supplies. C. P. Young, who has had over 30 years' experience both in Europe and in this country as master mechanic, chief engineer, superintendent and general manager in charge of shops, is president and treasurer; George S. Dodds, vice-president, and L. A. Murphy, secretary.

The Virginia & Mexico Mine & Smelter Corporation, American National Bank Building, Richmond, Va., is purchasing considerable equipment for shipment to its mines at Hostotipaquillo, Mexico. The purchases will include 30 stamps, 2 tube mills, 12 Wilfley concentrating tables, presses, steel cyanide tanks with necessary pumps, &c. The machinery is to be operated by independent motors.

The Forter-Miller Engineering Company, engineer and contractor, Hartle Building, Pittsburgh, has received an order from Dilworth, Porter & Co., Pittsburgh, for a number of heating furnaces of the Forter-Miller type, and has also received a tenth consecutive order for gas producers for the National Tube Company.

The Houston Engineering & Machine Company, Houston, Texas, has increased its capital stock from \$45,000 to \$75,000.

Work on the enlargement of the shops of the St. Louis & San Francisco Railroad at Sherman, Texas, will begin in 30 days. The company will spend \$50,000 on the improvements, and will also enlarge the yards at a cost of \$20,000.

Power Plant Equipment.

The Independent Light & Power Company, Davenport, Iowa, is preparing plans for the erection of a gas and electric plant, which are to be completed and in operation by spring of next year. The gas plant will have a capacity of about 400,000 cu. ft. daily, and the initial installation of the electric light plant will consist of two 500-kw. generating units. Engines for the new plant are being furnished by the Filer-Stowell Company, Milwaukee. Boilers of the Edgemoor type will be supplied by the Edgemoor Boiler Company, and Allis-Chalmers generators will be used.

The Otto Gas Engine Works, Philadelphia, Pa., which recently increased its capital stock, will use some of the increase for enlarging its plant and equipment. The company has recently placed large orders for machinery and does not expect to be in the market for more in the near future.

The Custodian, San Francisco, Cal., will receive bids until August 29 for motors, chain drives, air compressors and other supplies.

Walter G. Kirkpatrick, Jackson, Miss., is preparing plans for the municipal power plant of 200 hp. for Lawrenceburg, Tenn. The installation will include turbines, dynamos, electric pumps, &c.

The name of the Haberkorn-Haley Mfg. Company, Ft. Wayne, Ind., has been changed to the Haberkorn Engine Company.

The Town Board of Milltown, Ind., has granted a franchise for a water works system to a company represented by W. H. Roose of Corydon, Ind. The water will be pumped from Blue River to a reservoir.

The Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., has recently received several more contracts for the electrification of mines in western Canada, the largest calling for two 1950-hp. three-phase 3000-volt squirrel cage induction motors.

Foundries.

The Waterman Car Wheel & Foundry Company, Houston, Texas, has increased its capital stock from \$75,000 to \$100,000.

The new foundry of the American Foundry & Casting Company, Dayton, Ohio, has been placed in operation.

The West Side Foundry Company, Troy, N. Y., recently incorporated with a capital stock of \$100,000, will continue the business of the old company of the same name, manufacturing gray iron castings. The company has two foundries and within the last year has increased its capacity, having added a 72-in. cupola and made other improvements. William N. Sleiher is president; Charles A. Sleiher, vice-president, and R. A. Stephens, secretary.

James McGloughlin, proprietor of the Belknap Iron Foundry, Laconia, N. H., intends to build a new foundry, the present one being inadequate to take care of the increasing business. The principal work is making knitting machine castings.

Fires.

The press works of the Valvoline Oil Company, at Edgewater, N. J., were destroyed by fire August 1, the loss being about \$100,000.

The plant of the Armour Fertilizer Company at Fulton, near Jacksonville, Fla., was destroyed by fire August 4, the loss being about \$50,000.

The plant of the Andover Stamping Company, at Andover, N. Y., was destroyed by fire July 30. The loss is placed at \$25,000.

The plant of the York Felt & Paper Company, York, Pa., was burned July 31, the loss being placed at \$100,000.

The main building of the plant of the Cunningham Iron Company, South Boston, Mass., was burned August 2, with a loss of about \$100,000. The building was 100 x 150 ft., three stories high, and was used for the manufacture of boilers.

Hardware.

The Champion Lever Machine Company, Indianapolis, Ind., has been incorporated with a capital stock of \$100,000, for the purpose of marketing the Monitor lever cream separator. For the present the company will not operate a manufacturing plant, but will have its machines built in outside shops.

The Hayes Pump & Planter Company, Galva, Ill., maker of farm tools, pumps, shoveling boards and agricultural implements, is preparing to enlarge its office room by the erection of a two-story and basement building, which besides affording special convenience will provide nearly four times the space at present occupied.

The Beatrice Mfg. Company, Beatrice, Neb., has sold its plant and business to the Boss Mfg. Company, Kewanee, Ill. The Beatrice Mfg. Company made husking pegs, window latches, &c., and under the management of the new owner the factory will be enlarged and its output increased.

The Forest City Bit & Tool Company, Rockford, Ill., manufacturer of wood boring bits, hollow mortising chisels and tools, has let contracts for important additions to the factory plant, which include a new machine shop, 36 x 50 ft., two stories and basement, and a forging department, 28 x 34 ft. Orders for the machinery equipment required for these extensions have already been placed which, when installed, will double the capacity of the plant.

John W. Henney & Co., Freeport, Ill., makers of high grade carriages and light vehicles, have in contemplation the erection of a carriage factory, work upon which will be begun in the near future. A 3-acre tract for the factory site has been purchased, located near the main line and freight house of the Chicago, Milwaukee & St. Paul Railroad, which will afford convenient shipping facilities.

The large new addition to the plant of the Graham Nut Company, Neville Island, Pittsburgh, Pa., will be completed and placed in operation about August 15. The amount of business the company has on hand and the splendid prospects for the future have been duly considered, with the result that the company has placed orders for a large amount of nut and bolt machinery in addition to those already placed. When the extensions now under way have been completed the concern will have doubled its capacity in the manufacture of nuts and bolts, and expects to be able to make prompt deliveries on all orders for its products.

The Dairy Queen Cream Separator Company has been incorporated at Lebanon, Ind., with \$65,000 capital stock. S. N. Cragun is president; R. D. Voorhees, vice-president; D. V. Booher, secretary, and W. E. Callane, treasurer. E. F. Hedderich, inventor of the machine, will be superintendent. The factory building will be three stories, with 15,000 sq. ft. of floor space.

The Hyatt-Wise Mfg. Company, Columbus, Ohio, has been incorporated, with a capital stock of \$25,000, by Samuel W. Hyatt, Oscar Wise and others, to take over the business conducted by Messrs. Hyatt and Wise under the name of the U-Need-a-Light Company. The company will manufacture burners. S. W. Hyatt is president, treasurer and general manager of the company.

The Connecticut Steel & Wire Company, successor to the National Wire Works, Hartford, Conn., has removed to 57-61 Allyn street, where the floor space is about six times as great as that of the original plant. Here much additional machinery will be installed for the manufacture of the automobile trunk rack and the general line of wire office fixtures. The officers of the company are C. W. Ferguson, president and treasurer, and Charles W. Phelps, secretary. It is the intention of the company later to take up general automobile repair work and to fit up a garage.

The Light Mfg. & Foundry Company, Pottstown, Pa., has increased its capital stock from \$50,000 to \$150,000, to take care of important extensions the company is making to its plant. The company is taking up the bicycle and motor cycle business on a large scale, having secured a five-story building to accommodate this branch of the business.

The recent election of officers of the Atwater Mfg. Company, Plantsville, Conn., constituted a change in the management of the business. President J. H. Pratt and Secretary and Treasurer W. A. Barnes retired from the company July 16, and M. N. Woodruff was elected president, A. Edward Bradley, vice-president and general manager, and Edwin G. Lewis, Brooklyn, secretary and treasurer. Mr. Woodruff was formerly president

of the company and was succeeded by Mr. Pratt two years ago. The changes have resulted from the recent acquiring of the control of the stock by the Woodruff interests.

The factory of the A. J. Cook Whip Company, Westfield, Mass., was not seriously crippled by the recent fire. The manufacturing department containing all of the machinery was not affected and is now running full. The fire was in the trimming and coach varnish department. The stock was not damaged.

Miscellaneous.

The Model Iron & Wire Works, Milwaukee, Wis., has been incorporated with a capital stock of \$20,000 by J. Meyer, John H. Gilman and Charles Gersonde.

The Northern Motor Car Company, Detroit and Port Huron, Mich., maker of automobiles, will defer for the present the erection of an additional building, plans for which have been already prepared. Extensive alterations, however, are in contemplation, but they will not be undertaken at the present time.

The Black Mfg. Company, Chicago, has been incorporated with a capital stock of \$25,000, for the manufacture of tools, implements and machinery, of which the principal output will be dumping wagons and boxes. The incorporators are Addison L. Gardner, Carroll H. Jones and Forest A. Otis.

The Adjustable Steel Centering Company, Fond du Lac, Wis., has been incorporated with a capital stock of \$18,000, to manufacture steel centers or forms for use with the building of concrete sewers, culverts, conduits, subways, tunnels, man-holes, ducts, &c. These forms are adjustable both as to size and shape, the regular stock form having an expansion of 30 per cent., and therefore is adaptable within this limit to different sizes of work. The incorporators are J. E. Hennen, J. E. Dooley and H. T. Sackett.

The Armstrong Machine Company, Louisville, Ky., has been incorporated with a capital stock of \$10,000, for the purpose of marketing a patent machine for wrapping chewing gum, it being the purpose of the company to have the machines manufactured by contract. The incorporators are: Harry Y. Armstrong, Elgin, Ill.; Thomas L. Jefferson and Floyd Jefferson, Louisville.

The Alamo Cement Company, San Antonio, Texas, has bought a site upon which it intends to erect a new cement plant at a cost of about \$300,000. The plant will have a daily capacity of about 500 barrels.

The Sheldon Axle Company, Wilkes-Barre, Pa., has added to the main building of its spring department a structure, 60 x 150 ft., to be used for storage purposes, and a one-story extension, 32 x 180 ft., for the spring finishing department. An addition to the foundry, 25 x 154 ft., is also being erected. The improvements will cost about \$35,000 and are more for the purpose of furnishing additional room to even up its product than for increasing the capacity.

The Detroit Car Building & Equipment Company, Detroit, Mich., recently incorporated, has a well equipped plant of 7 acres of land, located on the Wabash, Michigan Central and Lake Shore railroads, which is ready for operation. The company is composed of well-known Detroit capitalists and will manufacture all kinds of freight and logging cars.

The recently incorporated Air Pump & Meter Company, Bradford, Pa., is building a plant for the manufacture of air pumps, to be used in connection with the system of pumping oil wells with compressed air, and an improved gas meter, patents on both of which are owned by the company.

The Wehrle Stove Company, Newark, Ohio, which recently purchased the Coshocton Machine Works, Coshocton, Ohio, has installed modern equipment and will operate it in connection with its Newark plant.

The American Motor Car Company, Indianapolis, Ind., has increased its capital stock from \$25,000 to \$100,000.

The S. Keighley Metal Ceiling & Mfg. Company, Pittsburgh, has received an order for 40,000 sq. ft. of Keighley skylighting for the new Callahan Building, now under erection at Youngstown, Ohio.

The Whitelaw Combined Endorsing Machine Company, Cleveland, Ohio, has been incorporated, with a capital stock of \$50,000, by James H. Whitelaw, W. D. Young, Edwin H. Gehbach and John F. Whitelaw. The company does not intend for the present to establish a factory for the manufacture of the new machine that it will place on the market.

At a meeting of the stockholders of the recently incorporated Hammock Steel Range Company, Knoxville, Tenn., directors were elected as follows: G. C. Childress, E. J. Wooten, Wm. H. King, Ernest Prater, T. J. Hinton, James G. Carson, Frank J. Jones, M. V. Hammock, Clarence W. Barber. The officers elected are: President and general manager, M. V. Hammock; vice-president, E. J. Wooten; secretary and treasurer, Frank J. Jones; general counsel, Clarence W. Barber. The new company will build its plant south of Knoxville, plans for which have already been drawn.

The Memphis Car Company, recently organized at Memphis, Tenn., has purchased 10 acres of land for \$7000, upon which it will erect a plant for the manufacture of car accessories and for the reconstruction and repairing of freight and electric cars.

The Iron and Metal Trades

The July output of Coke and Anthracite Pig Iron was somewhat disappointing. According to the returns received by *The Iron Age*, the production in July was 2,259,682 tons, which is 72,893 tons per day, as compared with 2,234,575 tons in June, at the rate of 74,486 tons per day. The steel works furnaces were chiefly responsible for this, the output having been 1,452,557 tons in July, compared with 1,457,230 tons in June. The industry entered the month of August with a capacity of 514,121 tons per week, as compared with 528,170 tons on July 1.

The strikes in the Iron ranges and at the docks are practically ended, and it is estimated that this week 700,000 tons of ore will be sent down from the docks at the head of the lakes. It may take some time, however, before the scattered workmen may be collected to get back to the former record breaking rate of work.

While the Pig Iron markets in the East are irregular and weak, but show a moderate amount of activity, the Southern and Western markets are very dull, because the great majority of sellers refuse to make any concessions whatever. This is notably true of the Southern furnaces, concerning whom there is only an occasional whisper of weakness. So far as can be judged, the rate of melting is as large as it has been, but the question, of course, is whether the founders are running along under the momentum of a past boom.

Eastern Steel makers report a somewhat better volume of business in Billets. It is understood that a leading interest has purchased 15,000 tons of Steel for delivery in the Philadelphia District.

Considering the general impression of absolute stagnation in the Steel Rail trade, this week's aggregate of sales of about 40,000 tons is not a bad showing. Among the purchases are 10,000 tons for a new road, made in Chicago; 6000 tons to the Idaho & Northern, for next year; 5000 tons for the Northern Pacific, for this year, and 8000 tons to a frog and crossing plant, partly for this year's and partly for next year's delivery.

The mills are reporting an improved demand from the car builders, and the shipyards have again placed material for two boats.

In the Bar Iron trade interest centers chiefly in the forthcoming wage scale for puddlers and finishers by the Conciliation Board appointed to adjust the differences between the Western Bar Iron mills and the Amalgamated Association. The decision is expected on Saturday.

Chicago reports that in the Structural trade mill orders and specifications are again outstripping the rolling capacities. In New York the contract for 10,000 tons for the new Edison power house has been placed.

The reports from the Wire, Tube and Sheet trades continue favorable.

The markets for Old Material all over the country seem overstocked and prices are lower.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

Aug. 7, July 31, July 10, Aug. 8,
1907. 1907. 1907. 1906.

PIG IRON, Per Gross Ton:

Foundry No. 2, Standard, Philadelphia	\$22.00	\$22.00	\$23.00	\$18.75
Foundry No. 2, Southern, Cincinnati	23.25	23.75	23.75	17.00
Foundry No. 2, Local, Chicago ..	24.50	24.50	25.50	18.75
Bessemer, Pittsburgh	22.90	22.90	23.90	18.85
Gray Forge, Pittsburgh	21.90	22.40	22.90	17.35
Lake Superior Charcoal, Chicago	27.50	27.50	27.00	19.25

BILLETS, &c., Per Gross Ton:

Bessemer Billets, Pittsburgh ..	29.50	30.00	30.00	27.50
Forging Billets, Pittsburgh ..	33.00	34.00	34.00	33.00
Open Hearth Billets, Phila.	31.75	31.75	32.00	29.00
Wire Rods, Pittsburgh	36.00	36.50	36.50	34.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00

OLD MATERIAL, Per Gross Ton:

Steel Rails, Melting, Chicago ..	17.00	17.25	18.00	14.00
Steel Rails, Melting, Phila.	17.50	17.50	17.75	16.75
Iron Rails, Chicago	20.75	20.75	24.50	21.25
Iron Rails, Philadelphia	21.50	22.50	25.00	21.00
Car Wheels, Chicago	24.50	24.50	24.50	18.00
Car Wheels, Philadelphia	25.00	25.00	25.00	16.50
Heavy Steel Scrap, Pittsburgh ..	17.75	17.75	18.00	16.50
Heavy Steel Scrap, Chicago	15.50	15.50	16.50	13.00
Heavy Steel Scrap, Philadelphia	17.00	17.00	17.00	16.50

FINISHED IRON AND STEEL,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia ..	1.85	1.85	1.83½	1.63½
Common Iron Bars, Chicago	1.78	1.78	1.78	1.66½
Common Iron Bars, Pittsburgh ..	1.70	1.70	1.70	1.50
Steel Bars, Tidewater, New York ..	1.86	1.86	1.86	1.64½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.50
Tank Plates, Tidewater, New York ..	1.86	1.86	1.86	1.74½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.60
Beams, Tidewater, New York ..	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York ..	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh ..	1.85	1.90	1.90	1.57½
Skelp, Sheared Steel, Pittsburgh ..	1.95	1.90	1.90	1.60

SHEETS, NAILS AND WIRE,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.50	2.50	2.50	2.40
Wire Nails, Pittsburgh	2.00	2.00	2.00	1.80
Cut Nails, Pittsburgh	2.10	2.05	2.05	1.75
Barb Wire, Galv., Pittsburgh ..	2.45	2.45	2.45	2.30

METALS, Per Pound:

	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	19.50	21.00	22.25	18.62½
Electrolytic Copper, New York ..	19.00	20.00	22.00	18.37½
Spelter, New York	5.80	5.95	6.30	6.00
Spelter, St. Louis	5.75	5.80	6.12½	5.90
Lead, New York	5.15	5.15	5.30	5.75
Lead, St. Louis	5.00	5.00	5.15	5.65
Tin, New York	38.60	40.25	41.35	39.00
Antimony, Hallett, New York ..	10.00	10.50	10.00	23.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York ..	\$4.09	\$4.09	\$4.09	\$3.94

Chicago.

FISHER BUILDING, August 7, 1907.—(By Telegraph).

Purchases last week of 17,000 tons of Standard Section Rails lent an air of activity to an otherwise quiet movement in this department of railroad requirements. In view of the cessation of buying by the principal steam roads, pending an agreement as to specifications and qualities, it may be noted that 11,000 tons of the above total were for a 100-mile line of new road, and 6000 tons were taken by an electric traction system. Besides the continued flow of specifications for finished products, which keep coming to the mills in unabated volume, there is a noticeable increase in the development of new business. This is specially true of Structural Shapes, Steel Bars, Sheets and Tubular goods, notwithstanding quite a number of important Structural deals involving large tonnages are unclosed and still pending. Averages are well sustained by a remarkably good volume of business arising from numerous small contracts. An improved demand from car builders has also added to the strength of the situation, so that, altogether, between new business and specifications, the mill output is hardly keeping pace with incoming tonnage. At no time during the present year has there been any scarcity of orders for Sheets, though the demand slackened off through recent weeks to an extent that permitted the mills to catch up a little on deliveries. Improvement in this respect is still far from satisfactory, and prompt shipments of both Black and Galvanized continue to command premium prices. The refusal of consuming interests to enter the market for forward requirements holds the Pig Iron market in a state well nigh ap-

proximating suspended animation. No transactions of consequence are reported, and the very light demand for prompt iron indicates that melters' stocks are not generally at a low ebb. A gratifying feature of the present situation is that premium prices for prompt delivery have been eliminated. Offers for such shipment are now practically on a par with fourth quarter prices. Scrap material is exceedingly dull and weak, and the 6500 tons to be offered by the railroads this week will certainly not improve its strength.

Pig Iron.—With buying interest too weak to overcome the inertia of general dullness, business in Pig Iron is practically at a standstill. Transactions for the week include sales of only a few scattering cars for prompt and a limited number of small lots for forward delivery. Prices on the former range from \$20 to \$20.50, Birmingham, for No. 2 Foundry, according to the degree of pressure on the seller to move on track and transit iron ahead of demurrage charges. Evidences of a disposition to shade the current quotation of \$20, Birmingham, for fourth quarter on Southern Iron have appeared in certain directions, and offers of \$19 for this delivery are reported. In the absence of any noteworthy transactions at this figure, however, it is likely that the offers referred to represent special conditions, and are not therefore indicative of the general market level. The quotation of \$18 to \$18.50, Birmingham, for first quarter of 1908 is unchanged, and for Northern Iron \$22, Chicago, is still held. But, as noted in previous reports, these prices are to some extent nominal, for the reason that furnace interests are not strongly inclined to establish fixed minimum prices for the far ahead deliveries. In spite of the present apathy it cannot be said that the market is fundamentally weaker, except for spot iron, since it is not yet apparent that consumers' requirements for the remainder of the year will fall short of unsold furnace schedules. Unless sellers' estimates are badly awry, there will be no spreading gap disclosed between them on the final wind up. Furnace, instead of Chicago delivery, prices on Lake Superior Charcoal were inadvertently quoted in last report, and are herewith revised. The following prices are for August and September delivery, f.o.b. Chicago:

Lake Superior Charcoal.....	\$27.50 to \$28.00
Northern Coke Foundry, No. 1.....	25.00 to 25.50
Northern Coke Foundry, No. 2.....	24.50 to 25.00
Northern Coke Foundry, No. 3.....	23.50 to 24.00
Northern Scotch, No. 1.....	25.50 to 26.00
Ohio Strong Softeners, No. 1.....	25.50 to 26.00
Ohio Strong Softeners, No. 2.....	25.00 to 25.50
Southern Coke, No. 1.....	25.35 to 25.85
Southern Coke, No. 2.....	24.85 to 25.35
Southern Coke, No. 3.....	24.35 to 24.85
Southern Coke, No. 4.....	23.85 to 24.35
Southern Coke, No. 1 Soft.....	25.35 to 25.85
Southern Coke, No. 2 Soft.....	24.85 to 25.35
Southern Gray Forge.....	21.35 to 21.85
Southern Mottled.....	21.35 to 21.85
Malleable Bessemer.....	24.90 to 25.40
Standard Bessemer.....	25.90 to 26.40
Jackson Co. and Kentucky Silvery, 6 %	31.40 to 31.90
Jackson Co. and Kentucky Silvery, 8 %	32.40 to 32.90
Jackson Co. and Kentucky Silvery, 10 %	33.40 to 33.90

(By Mail.)

Billets and Rods.—Aside from an inquiry for a round lot of Rolling Billets, which did not seem to represent a resolute purpose of placing the business, there have been no noteworthy developments. Orders for Forging Billets are of a routine character and are placed at prices ranging from \$36 to \$38. The movement in Rods is light, and prices are firm and unchanged, at \$37 to \$38, Pittsburgh.

Rails and Track Supplies.—A few small lots of Steam Rails, evidently for incidental requirements, constitute the entire tonnage placed since last report by the leading railroad systems. A new project, however, embracing the construction of a steam road, 100 miles in length, placed an order for its Rail requirements, amounting to 11,000 tons. A purchase of 6000 tons of Traction Rails for an electric line is also reported. We quote as follows: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.90c. to 1.95c.; Spikes, 2.20c. to 2.30c., according to delivery; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 30 to 45 lb. sections, \$34; 25-lb., \$35; 20-lb., \$36; 16-lb., \$37; 12-lb., \$38, f.o.b. mill. Standard Sections, \$28, f.o.b. mill, full freight to destination.

Structural Material.—Mill orders and specifications are again outstripping rolling capacities. The increase in volume of tonnage coming in has moved delivery dates ahead, which for the leading interest are now extended to 60 days. The demand has been strengthened, not so much by individual requirements of unusually large tonnage, as by the great number of small jobs coming in from all sources. Car shops, too, have been an important factor in the general contribution of tonnage. Fabricators are well supplied with work, and though the week has witnessed no closures of important contracts there has been a compensating volume of smaller business taken. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices, at Chicago, are as follows: Beams and Channels, 3 to 15 in.,

inclusive, 1.88c.; Angles, 3 to 6 in., 1/4-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—So far as the Western mills are concerned, interest for the remainder of the year is centered in specifications rather than new business. These are being furnished as fast as desired, and shipments are being urged by consumers. Beyond the tonnage comprised in jobbers' contracts no large transactions have appeared in the market. We quote for future delivery as follows: Tank Plates, 1/4-in. and heavier, wider than 6 1/4 and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for 1/4-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, 1/4-in. and heavier, up to 72 in. wide, 2.20c. to 2.30c.; from 72 to 96 in. wide, 2.30c. to 2.40c.; 3-16 in., up to 60 in. wide, 2.30c. to 2.40c.; 72 in. wide, 2.50c. to 2.65c.; No. 8, up to 60 in. wide, 2.35c. to 2.45c.; Flange and Head quality, 0.25c. extra.

Sheets.—Renewed activity in new business is evidenced by the increasing number of orders received. Such demand, if sustained, will retard the progress being made in relief of delinquent mill shipments. Local mills are now able to furnish Black Sheets in four to five weeks, and Galvanized in five to six weeks. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 2.03c.; No. 12, 2.08c.; No. 14, 2.13c.; No. 16, 2.23c.; Box Annealed, Nos. 17 to 21, 2.53c.; Nos. 22 to 24, 2.58c.; Nos. 25 to 26, 2.63c.; No. 27, 2.68c.; No. 28, 2.78c.; No. 29, 2.88c.; No. 30, 2.98c.; Galvanized Sheets, Nos. 10 to 14, 2.83c.; Nos. 15 and 16, 3.03c.; Nos. 17 to 21, 3.18c.; Nos. 22 to 24, 3.33c.; Nos. 25 and 26, 3.53c.; No. 27, 3.73c.; No. 28, 3.93c.; No. 30, 4.43c. Sheets from store: Blue Annealed, No. 10, 2.50c.; No. 12, 2.55c.; No. 14, 2.60c.; No. 16, 2.70c.; Box Annealed, Nos. 18 to 21, 2.80c.; Nos. 22 to 24, 2.85c.; No. 26, 2.90c.; No. 27, 2.95c.; No. 28, 3.05c.; No. 30, 3.45c.; Galvanized, from store: Nos. 10 to 20, 3.30c. to 3.35c.; Nos. 22 to 24, 3.55c. to 3.60c.; No. 26, 3.65c. to 3.70c.; No. 27, 3.85c. to 3.95c.; No. 28, 4.15c.; No. 30, 4.65c. to 4.70c.

Bars.—Users of Steel Bars are piling in specifications and asking for early delivery. The amount of new business being offered is in the aggregate quite considerable, though contracts covering the requirements of practically all the large interests have been placed. The demand for Iron Bars is relatively small, though prices are fairly firm. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.78c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—A continued demand, equaling the output capacity of the mills, is the condition of monotonous sameness that still exists in Tubular goods. Delivery dates run far in advance and are not yet specifically named by the leading interest. The following mill discounts are quoted: Black Pipe, 3/4 to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, 3/4 to 6 in., 61.2. These discounts are subject to 1 point on the base. From store in small lots, Chicago jobbers quote 68 per cent. on Black Steel Pipe, 3/4 to 6 in. About 4 points advance above these prices is asked for Iron Pipe.

Boiler Tubes.—The best criterion of demand, aside from contract orders, is the movement from jobbers' stocks. This is quite active and requirements of unusual size are taken from these sources because of pressing needs and slow mill shipments. Mill quotations for future delivery on the base sizes are as follows: 2 3/4 to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2 1/2 in. and smaller, and lengths over 18 ft., and 2 1/2 in. and larger and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1 1/2 in.....	35	35	35
1 1/2 to 2 1/4 in.....	50	35	35
2 1/4 in.....	52 1/2	35	35
2 1/2 to 5 in.....	60	47 1/2	47 1/2
6 in and larger.....	50	35	..

Merchant Steel.—A seasonal movement of Shapes and Bars and Tire sizes is noted. Under the pressure of sharp competition Shafting prices have yielded slightly and discounts are revised. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish, up to 1 1/2 x 1/2 in., 1.93c.; Iron Finish, 1 1/2 x 1/2 in. and larger, 1.78c., base; Channels for solid Rubber Tires, 3/4 to 1 in., 2.28c., and 1 1/4 in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46 1/4c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7 1/4c. to 8c., and still higher prices are asked on special grades. Shafting, 50 and 10 per cent. off in car lots, and 50 and 5 per cent. in less than car lots, base territory.

Cast Iron Pipe.—Three or four small lettings, with an aggregate tonnage of about 2000 tons, comprise the bulk of

the week's business. Bids have been submitted on Cast Iron Fittings for the Gary, Ind., water works system, amounting to about 600 tons. Steel Pipe mains will be used in this system. Business is, on the whole, very quiet, and even small orders are not over plentiful. We quote per net ton, Chicago, as follows: Water Pipe, 4-in., \$38 to \$39; 6 to 12 in., \$37 to \$38; 16-in. and up, \$36 to \$37, with \$1 extra for Gas Pipe.

Coke.—With no appreciable change in demand or general market conditions, 72-hr. Connellsville Coke is quoted at \$3 to \$3.25, at the oven.

Old Material.—Buying by consuming interests is practically at a standstill. Both mills and melters seem to be well supplied, and under present conditions dealers hesitate to invite further depression of prices by pressing sales. Though extremely inactive the market held fairly well during the past week, and on only a few grades are slight recessions noted. Nearly 6500 tons of material is this week offered by the railroads, which at the present juncture will bear heavily on an already overloaded market. The lists and tonnages are as follows: Wisconsin Central, 400 tons; Missouri Pacific, 900 tons; Santa Fe, 2500 tons; Great Northern, 2000 tons; Chicago & Northwestern, 625 tons. We quote as follows, per gross ton, f.o.b. Chicago.

Old Steel Rails.....	\$20.75 to \$21.25
Old Steel Rails, rerolling.....	17.00 to 17.50
Old Steel Rails, less than 3 ft.....	17.00 to 18.00
Relaying Rails, standard sections, subject to inspection.....	28.00 to 30.00
Old Car Wheels.....	24.50 to 25.00
Heavy Melting Steel Scrap.....	15.50 to 16.00
Frogs, Switches and Guards, cut apart.....	15.50 to 16.00
Mixed Steel.....	11.50 to 12.00

The following quotations are per net ton:

Iron Fish Plates.....	\$16.75 to \$17.00
Iron Car Axles.....	23.50 to 24.00
Steel Car Axles.....	20.25 to 20.75
No. 1 Railroad Wrought.....	14.50 to 15.00
No. 2 Railroad Wrought.....	13.50 to 14.00
Railway Springs.....	15.00 to 15.50
Locomotive Tires, smooth.....	17.00 to 17.50
No. 1 Dealers' Forge.....	12.00 to 12.50
Mixed Bushing.....	10.50 to 11.00
Iron Axle Turnings.....	10.50 to 11.00
Soft Steel Axle Turnings.....	10.50 to 11.00
Machine Shop Turnings.....	10.50 to 11.00
Cast Borings.....	9.00 to 9.50
Mixed Borings, &c.....	9.00 to 9.50
No. 1 Mill.....	9.75 to 10.25
No. 2 Mill.....	8.75 to 9.25
No. 1 Bolters, cut to Sheets and Rings.....	10.50 to 11.00
No. 1 Cast Scrap.....	17.00 to 17.50
Stove Plate and Light Cast Scrap.....	14.00 to 14.50
Railroad Malleable.....	16.00 to 16.50
Agricultural Malleable.....	14.75 to 15.25
Pipe and Flues.....	11.50 to 12.00

Metals.—The depletion of stocks has at length compelled a good many buyers to come into the market. They are, however, buying only for immediate requirements in the hope of a further break in prices. Quotations are revised on Copper and Antimony. Trade in Old Metals is quiet, and prices on all grades have declined about $\frac{1}{2}$ c. We quote as follows: Casting Copper, 22c. to 22 $\frac{1}{2}$ c.; Lake, 23 $\frac{1}{2}$ c. to 24c., in car lots for prompt shipment; small lots, $\frac{1}{4}$ c. to $\frac{3}{8}$ c. higher; Pig Tin, car lots, 42 $\frac{1}{2}$ c.; small lots, 43 $\frac{1}{2}$ c.; Lead, Desilverized, 5.75c. to 5.85c. for 50-ton lots; Corroding, 6.50c. to 6.60c., for 50-ton lots; in car lots, 2 $\frac{1}{4}$ c. per 100 lb. higher; Spelter, 6.25c.; Cookson's Antimony, 16c., and other grades, 15c. to 15 $\frac{1}{2}$ c.; Sheet Zinc is \$8.35 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 19 $\frac{1}{2}$ c.; Heavy Copper, 19c.; Copper Bottoms, 16 $\frac{1}{2}$ c.; Copper Clips, 17 $\frac{1}{2}$ c.; Red Brass, 17c.; Red Brass Borings, 14 $\frac{1}{2}$ c.; Yellow Brass, 14c.; Yellow Brass Borings, 12 $\frac{1}{2}$ c.; Light Brass, 10 $\frac{1}{2}$ c.; Lead Pipe, 4 $\frac{1}{2}$ c.; Tea Lead, 4.15c.; Zinc, 4 $\frac{1}{2}$ c.; Pewter, No. 1, 29 $\frac{1}{2}$ c.; Tin Foil, 34c.; Black Tin Pipe, 39c.

Birmingham.

BIRMINGHAM, ALA., August 4, 1907.

Pig Iron.—The market is extremely quiet. No orders of any size have been placed within the past few days, and business is practically at a standstill. Considering the small amount of buying during the past two or three months, prices are remaining remarkably firm. The larger producers have made but slight deviations from prevailing prices, the concessions we hear about being confined almost exclusively to the smaller interests, who for the past year or more have been reserving their output to sell as spot Iron. Under ordinary conditions the tonnage of the latter is hardly sufficient to affect the market, but during these strenuous times it is the small producer who sets the pace, and it requires a great deal of fortitude on the part of a large interest to pursue a prearranged policy, while its competitor is taking all the business. The larger producers are doing all in their power to prevent a slump and claim they have the situation well in hand. No requests are being received to withhold shipments, but, on the other hand, melters are as urgent in their requests for deliveries as during the first half of the year. Railroads report business even better than last summer, and cars are already becoming scarcer, with ship-

ments requiring a much longer time en route than three months since. As the cotton crop will begin moving within the next few weeks it is likely we will have the same shortage of cars this fall as we did last, and it would therefore be advisable for melters to get in their contract Iron well in advance of actual requirements. Prices continue somewhat erratic, but the following are, perhaps, the minimum and maximum quotations on a No. 2 Foundry basis: Third quarter, \$20.50 to \$21.50; last quarter, \$19.50 to \$20; first quarter next year, \$18.50. While all the furnaces are tentatively quoting \$18.50 for the first quarter of 1908, no business is being booked at that price, and it is understood that orders could be placed at lower figures. Practically all melters, however, are content to let the future take care of itself so far as next year's purchases are concerned.

The Philadelphia Furnace of the Sloss-Sheffield Steel & Iron Company was blown in during the past week, after being out for more than a year undergoing repairs. A skip-hoist and many other improvements have been added, and it is expected that the output will be largely increased.

Cast Iron Pipe.—The Pipe market is rather quiet at the present time, no immediate lettings of large size being under consideration. Current orders for small tonnage are coming in regularly and serve to keep order books in good shape. It is reported that Kansas City, Mo.; Atlanta, Ga., and Nashville, Tenn., are getting up specifications preparatory to asking for bids on large contracts. Some of this will be required the latter part of this year, but the larger percentage will be for delivery during 1908. While prices are being well maintained by some, others who have fewer orders are making slight concessions. We therefore hear of the following quotations on Water Pipe, per net ton, f.o.b. Birmingham: 4 to 6 in., \$34 to \$35; 8 to 12 in., \$33 to \$34; over 12-in., average, \$31, with \$1 per ton extra for Gas Pipe.

Old Material.—The situation is about the same as has been reported during the past few weeks. There is always more or less business, but, like every one else, melters of Scrap are becoming more conservative and are not disposed to contract far in advance of actual requirements. Dealers are carrying only average stocks and are not inclined to take on more than they can dispose of, unless exceptionally favorable prices are made. Quotations are about as follows per gross ton, f.o.b. cars here:

Old Iron Rails.....	\$22.00 to \$22.50
Old Iron Axles.....	18.50 to 19.00
Old Steel Axles.....	17.50 to 18.00
Old Car Wheels.....	20.50 to 21.00
No. 1 Railroad Wrought.....	18.50 to 19.00
No. 2 Railroad Wrought.....	13.50 to 14.00
No. 1 Country Wrought.....	13.00 to 13.50
No. 2 Country Wrought.....	12.00 to 12.50
Wrought Pipe and Flues.....	13.50 to 14.00
Railroad Malleable.....	14.00 to 14.50
No. 1 Steel.....	15.00 to 15.50
No. 1 Machinery Cast.....	16.00 to 16.50
Stove Plate and Light Cast.....	13.00 to 13.50
Cast Borings.....	8.50 to 9.00

Philadelphia.

PHILADELPHIA, PA., August 6, 1907.

The demand for Pig Iron has not improved, neither have prices changed to any appreciable extent. Buyers seem to be utterly indifferent, and show no disposition to purchase for forward delivery. What little business is done is almost entirely for carload to 100 or 200 ton lots for immediate shipment. A great deal of Iron is being delivered, however, and while there was considerable shrinkage in consumption during the last month, business is beginning to resume normal conditions. There are no indications that there will be any great falling off in consumption, but it is evident that supplies are quite equal to all demands, if not a little more than that. Whether this is due to increased production or decreased consumption is not quite clear at the present time, probably a little of both, but it is believed that some time during the next two or three weeks the situation will be more clearly defined than it is at the present time. The impression is, however, that raw materials will have to go lower before there is any active renewal in the demand, under which impression consumers are not disposed to enter the market until there are some signs of a general movement in that direction. Makers of Iron would be glad to enter up new business, but as their current output is almost all taken on back contracts, they see no reason for aggressiveness, and it is somewhat significant that prices have yielded so little considering the almost entire absence of demand. At the moment the pros and cons appear to be so evenly balanced that it is impossible to say which side will have the advantage two or three weeks from now, but it is pretty sure that a good deal of business will be entered during that period at prices which will probably give a fair indication of what they are to be during the remainder of the year.

Pig Iron.—There has been more inquiry during the past day or two, and to that extent sellers of Pig Iron feel more encouraged. This does not necessarily mean heavy buying in the near future, but it discloses the fact that some inter-

ests need a replenishment of stocks, and that they will probably be made in course of the next few days. This, however, is confined almost exclusively to Gray Forge and other cheap Irons for both mill and foundry purposes, for which quotations have been made, varying from \$19.50 to \$21, delivered. There is a great difference in the quality, however, the low prices being quoted on Iron very high in sulphur, the other being for strictly standard qualities. Apart from this, conditions are not materially different from what they were a week ago. Foundry grades are inactive and barely steady, at prices quoted in our last report, but there is no forward buying, and so little mention of such a thing that one might suppose that it was one of the lost arts. Buyers are evidently well covered for some time, as the tonnage even for small lots for early delivery is very trifling, and in many cases is merely to keep up regular mixtures. Furnaces are in good shape, however, and are not accumulating much, if any, Iron, so that they can stand out for awhile longer without being urgent for additional business. Still, it is felt that it would be a good thing if a basis of prices could be agreed upon for a renewal of contracts, as there is no question that it would bring in a great deal of business and remove much of the uncertainty which has prevailed for some time past. The objection to this, however, is to know what figures would be acceptable to both parties. But this is not a question of equity, but of conditions in the future, and these, unfortunately, are too obscure for any one to penetrate at the present time. It would seem, therefore, that there is no alternative but to drift along, waiting until light appears from some source, under which a basis may be reached which will be, and which, as a matter of fact, must be, in accordance with conditions, be they better or worse than they are to-day. Basic Iron is extremely dull. No sales have been reported during the past several days, but there are inquiries for a few small lots on which \$21 to \$21.50 has been quoted, but buyers seem unwilling to respond to these figures. Large buyers appear to have lost all interest in the market, but expect considerable reductions before they renew contracts that are now running. Low Phosphorus Pig Iron is also very dull, but small lots are taken at from \$27.50 to \$28, delivered. Furnaces have little or nothing to offer, however, so that any demand for large lots would be quickly reflected in prices. General quotations for deliveries in buyers' yards, eastern Pennsylvania or adjoining territory, would be about as follows:

No. 2 X Foundry.....	\$22.00 to \$23.00
Gray Forge.....	19.50 to 21.00
Basic.....	21.00 to 22.00
Low Phosphorus.....	27.50 to 28.00

Ferroalloys.—There seems to be very little business, although prices are again quoted at somewhat lower figures, and shipments of Ferromanganese during the later months of the year could be done at \$60 to \$61, and for spot or prompt shipments at \$62 to \$63.

Steel.—The demand for Steel is well maintained, and the incoming business to the mills is fully equal to the shipments, which are pretty well up to the full capacity. Prices are steady at \$31.75 to \$32.75 for nearby deliveries of Ordinary Rolling Billets, and \$35 to \$37 for Forging Steel.

Plates.—There is very little change to note in the Plate trade. There is a steady demand for small and medium sized lots, which with back orders keep the mills running to their full capacity, and in some cases require a little extra time to make satisfactory shipments. Prices unchanged, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel.....	1.85	1.90
Flange or Boiler Steel.....	1.95	2.05
Marine.....	2.20	2.25
Locomotive Firebox Steel.....	2.40	2.45
The above are base prices for ¼-in. and heavier. extras apply:		The following Extra per 100 lb.
3-16-in. thick.....		\$0.10
Nos. 7 and 8, B. W. G.....		.15
No. 9, B. W. G.....		.25
Plates over 100 to 110 in.....		.05
Plates over 110 to 115 in.....		.10
Plates over 115 to 120 in.....		.15
Plates over 120 to 125 in.....		.25
Plates over 125 to 130 in.....		.50
Plates over 130 in.....		1.00

Structural Material.—The local demand is not quite so active as it has been for the last two or three weeks, although a fairly satisfactory amount of small miscellaneous business is being entered. The mills are full in most of their departments, however, and expect a more urgent demand in the near future. Prices remain unchanged, at 1.85c. to 2c., according to specification.

Bars.—Best Refined Bar Iron is held quite firm, and it is not thought that any first-class Iron can be had at less than 1.85c. Ordinary Iron, however, is reported at a lower figure without having any influence on those whose output is fully up to the standard. Steel Bars are steady at about the same price as best Refined for prompt shipments, but somewhat lower for late deliveries.

Sheets.—There is little or no change in conditions as regards the Sheet mills, which are fully employed at unchanged prices, which are about as follows for mill shipments, and a tenth more for small lots: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 to 26, 3c.; No. 27, 3.10c., and No. 28, 3.20c.

Old Material.—The market for Scrap material seems to be verging on demoralization, as there is very little demand, with a great many anxious sellers. It is difficult to quote exact prices, but the following is a fair average of bids and offers for deliveries in buyers' yards:

No. 1 Steel Scrap.....	\$17.00 to \$17.50
Low Phosphorus.....	23.00 to 23.50
Old Steel Axles.....	20.50 to 21.00
Old Iron Axles.....	29.00 to 30.00
Old Iron Rails.....	21.50 to 22.00
Old Car Wheels.....	25.00
Choice No. 1 R. R. Wrought.....	18.50 to 19.00
No. 1 Yard Scrap.....	16.00 to 17.00
Long and Short.....	16.00 to 16.50
Machinery Scrap.....	19.00 to 19.50
Wrought Iron Pipe.....	15.00 to 15.50
No. 1 Forge Fire Scrap.....	15.50 to 16.00
No. 2 Light.....	9.50 to 10.00
Wrought Turnings.....	14.50 to 15.00
Stove Plate.....	15.00 to 15.50
Cast Borings.....	13.50 to 14.00
Grate Bars.....	14.50 to 15.00

Pittsburgh.

PARK BUILDING, August 7, 1907.—(By Telegraph).

Pig Iron.—The market continues extremely quiet, very little Iron changing hands. The only sale of any amount the past week was 5000 tons of Bessemer Iron for August shipment, sold by W. P. Snyder & Co. to the Steel Corporation, for August delivery, at \$22, Valley furnace. The Westinghouse Electric & Mfg. Company has bought a small tonnage of Bessemer for prompt delivery at \$22.25 and \$22.50, Valley furnace. While the Steel Corporation recently bought 15,000 tons of Bessemer pig for August delivery at \$22, at furnace, small lots for prompt delivery are held at \$22.25 and \$22.50, Valley furnace. There is not much demand for Foundry Iron, and, owing to the falling off in their business foundries are not taking Iron as rapidly as they were, and the available supply for prompt delivery is larger. Prices are somewhat weak, and we quote Northern No. 2 Foundry for August and September shipment at about \$23, Valley furnace, but note that several furnaces, particularly one that has recently started, are naming lower prices. There has been nothing done in Forge Iron in this market for some time and prices are merely nominal. We quote Northern Forge at \$21, Valley furnace, or \$21.90, Pittsburgh.

Steel.—The Carnegie Steel Company has recently bought about 10,000 tons of Bessemer and Open Hearth Billets from the Pennsylvania Steel Company and the Alan Wood Iron & Steel Company, the Open Hearth Steel to go to an identified interest, and the Bessemer Billets to be applied on contracts. We quote Bessemer Billets at \$29.50 to \$30, and Open Hearth, \$31.50 to \$32, Pittsburgh. Forging Billets are \$33 to \$34, Pittsburgh, while Sheet Bars are held at \$31, Pittsburgh or Youngstown mill.

(By Mail.)

The usual summer dullness is now at its height in the Iron trade, and conditions are extremely quiet, but, taken as a whole, the market is strong. There is practically no demand for Pig Iron, and there have been no sales of any moment since the purchase of 10,000 tons by the Steel Corporation in the latter part of July at the reported price of \$22, Valley furnace. Some of the Pig Iron dealers are asking \$22.25 and \$22.50 for Bessemer Iron for prompt shipment, but consumers are evidently fully covered. As yet there has been no decision of the Conciliation Board on the puddlers' and finishers' scale, but it is expected to be announced on Saturday, the 10th. The Coke market is somewhat stronger, due to a better demand, but Scrap is very dull and prices are weak. In Finished Iron and Steel, such as Structural Shapes, Plates, Pipe, Steel Bars and Wire products, the demand continues heavy. Sheets and Tin Plate are rather quiet, but on Sheets the mills are reasonably well filled for the balance of this year, while on Tin Plate there is not much tonnage on the books of the mills for the last quarter, and it is understood that stock is being piled up quite freely in anticipation of a heavy demand later on, when the canning interests and other large consumers are ready to determine their requirements. While the general situation is quiet, the outlook is far from being discouraging, as some of the pessimists would lead the trade to believe, but, on the contrary, indications are that, after the usual summer lull is over, conditions will be active for the balance of this year at least.

Ferromanganese.—We note a considerable inquiry for balance of the year delivery, and can report sales of about 400 tons of English 80 per cent. for delivery over the last four months on the basis of \$61, Pittsburgh, and about 50 tons for prompt shipment, at \$63, Pittsburgh. We quote

prompt Ferro at \$63, and for last quarter of the year at \$60 to \$61, Pittsburgh.

Muck Bar.—There is a fair demand, but very little Bar is being offered, and prices are firm. Owing to the decline in prices of Forge Iron, Muck Bar is lower, and we quote best grades made from all Pig Iron at \$37, Pittsburgh. On a firm offer this price might be shaded about 50 cents a ton.

Skelp.—The mills are pretty well filled with orders for the balance of this year, and are much behind in deliveries on contracts. Prices are firm, and we quote: Grooved Steel Skelp, 1.85c. to 1.90c.; Sheared Steel Skelp, 1.95c. to 2c.; Grooved Iron Skelp, 2.15c. to 2.20c., and Sheared Iron Skelp, 2.25c. to 2.40c., depending on sizes and widths. All these prices are f.o.b. maker's mill.

Wire Rods.—The continued heavy demand for Wire products is reflected in Rods, which continue scarce for prompt delivery, and prices are firm. We quote Bessemer Rods at \$36 to \$36.50, and Open Hearth Rods, at \$37 to \$37.50, Pittsburgh.

Steel Rails.—Discussion and correspondence are still under way between the railroads and the Rail mills as to what changes are needed in the making of Steel Rails to meet better the requirements of heavier rolling equipment and greater speed. The chances are that a heavier section Rail, 125 lb. or more, will be adopted by the leading railroads, and if this is done it means a great increase in the consumption of Steel. There is not much inquiry for Standard Sections, the Carnegie Steel Company having booked less than 10,000 tons in the past week. There is a good demand for Light Rails, and the local mill is pretty well sold up for the balance of this year. We quote Light Rails as follows: \$33 to \$34 for 20 to 45 lb.; \$34 to \$35 for 16-lb., and \$35 to \$36 for 12-lb., at mill. Angle Splice Bars are held at 1.65c., and Standard Section Rails at \$28, at mill.

Plates.—New business is fairly heavy, while specifications on contracts are coming forward freely, and the mills are about as badly congested with work as at any time this year, and are not catching up on back deliveries to any extent. The Carnegie Steel Company is filled for the rest of this year, and will likely carry over a good deal of tonnage into next year. The other Plate mills are also well filled, and prompt deliveries continue to bring slight premiums. We quote: Tank Plates, 1/4-in. thick, 6 1/4 in. up to 100 in. wide, 1.70c. to 1.80c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than 1/4-in. to and including 3-16-in.	
Plates on thin edges	\$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Flrexbox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell Grade of Steel is abandoned	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within 10 days from date thereof, discount of 1/2 of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—The business entered by the American Bridge Company in July amounted to about 46,000 tons, which is regarded as a splendid record for a summer month. There have been no important contracts placed in this district recently, and while some large work is in sight, it is probable that some of this may go over into next year, as the present condition of the money market is not favorable for getting funds. Deliveries by the mills on Structural Shapes are fairly satisfactory, but on Steel Bars and Plates they are much behind. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x 1/4 in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3 1/2 in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—The new demand in July was only fair, and a much lighter tonnage was placed than in June. The Sheet mills are pretty well filled for the balance of this year, and prices on Black and Galvanized are firm, but on Painted Roofing Sheets are sometimes slightly shaded. The mills are making slightly better deliveries on Black and Blue Annealed Sheets, but are not catching up to any extent on Galvanized. We quote: Blue Annealed Sheets, No. 10 gauge and heavier, 1.85c.; Nos. 11 and 12, 1.90c.; Nos. 13 and 14, 1.95c.; Nos.

15 and 16, 2.05c.; Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.65c.; Nos. 12 and 14, 2.75c.; Nos. 15 and 16, 2.85c.; Nos. 17 to 21, 3c.; Nos. 22 and 24, 3.15c.; Nos. 25 and 26, 3.35c.; No. 27, 3.55c.; No. 28, 3.75c.; No. 29, 4c., and No. 30, 4.25c. We quote No. 28 gauge Painted Roofing Sheets at \$1.85 per square, and Galvanized Roofing Sheets, No. 28 gauge, \$3.25 per square, for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances.

Hoops and Bands.—We note an active demand, and the mills are entering a good deal of tonnage for shipment over the balance of this year, and at full official prices, which are as follows: Steel Hoops, 2c., and Bands for all purposes at 1.60c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of \$2 a ton being charged for less than carloads.

Cotton Ties.—All the large consumers of Cotton Ties placed their contracts some time ago, on which deliveries are now being made by the mills, and only small stray orders are now being placed at the August price, which is 0.96 1/2c. per bundle.

Tin Plate.—The mills have considerable tonnage on their books for this month and September delivery, but are not so well fixed for the last quarter, the lateness of the fruit crop causing the postponement of placing contracts, which at this time last year had already been given out. It is expected that there will be a better buying movement in Tin Plate for last quarter delivery within a short time. We quote \$3.90 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

Bars.—A decision of the Conciliation Board appointed to settle the dispute between the Bar Iron mills and the Amalgamated Association on the wage scale for puddlers and finishers is expected to be announced on Saturday, the 10th. Both sides have fully presented their cases, and the decision of the Board is awaited with much interest. Orders for Steel Bars continue heavy, and engagements on the books of the Republic, Jones & Laughlin and Carnegie companies will carry them through the rest of this year. As high as 1.85c. is being paid for Steel Bars for reasonably prompt shipment. New business in Iron Bars is only fairly heavy, and the mills can make quite prompt deliveries. We quote Refined Iron Bars at 1.70c. to 1.75c., Pittsburgh, and Steel Bars for forward delivery at 1.60c., base, half extras, f.o.b. Pittsburgh.

Spelter.—There is but little buying and prices are weak, prime grades of Western Spelter being offered at about 5.77 1/2c., St. Louis, equal to 5.90c., Pittsburgh.

Merchant Steel.—Consumers covered their requirements quite generally some time ago, on which they are specifying freely, and shipments by the mills are heavy. Prices are fairly firm and we quote: Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c., for ordinary grades, and 10c. and upward for special grades. We quote Cold Rolled Shafting at 50 per cent. off in carloads, and 45 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—The market is quieter than for some time, but is expected to improve as soon as the railroads commence to place orders for Rails for next year delivery. The demand for Boat and other kinds of Spikes is quite active and prices firm. We quote Railroad Spikes, standard sizes, at \$2.15 to \$2.20, and small sizes at \$2.30 to \$2.35 per 100 lbs.

Merchant Pipe.—There is no let-up in the demand for Pipe, and the mills are not able to catch up on deliveries. The engagements of some of the leading mills at this time as compared with August of last year are three or four times heavier, and none of the Pipe mills is in position to take on tonnage, except for delivery two or three months ahead. It is probable that two or three very large Pipe lines would have been placed before this had the parties wanting them been able to find mills that could handle the business and make the desired deliveries. Official discounts are rigidly held, and are as follows:

	Merchant Pipe.	
	Jobbers, carloads.	Steel.
	Black.	Galv.
1/4 to 1/2 in.	.65	.49
3/8 in.	.67	.53
1/2 in.	.69	.57
5/8 to 6 in.	.73	.63
7 to 12 in.	.70	.55
Extra strong, plain ends:		
1/4 to 3/8 in.	.58	.46
1/2 to 4 in.	.65	.53
4 1/2 to 8 in.	.61	.49
Double extra strong, plain ends:		
1/2 to 8 in.	.54	.43

All above discounts are subject to 1 point on the base and 5 per cent. on the net.

Official discounts on Iron Pipe, which are shaded one-half point or more to the large trade, are as follows, f.o.b. Pittsburgh:

Standard Genuine Iron Pipe.		Black.	Galv.
$\frac{3}{4}$ to 6 in.		.67	.57
$\frac{1}{2}$ in.		.62	.50
$\frac{3}{4}$ in.		.60	.42
$\frac{1}{2}$ and $\frac{3}{4}$ in.		.58	.42
7 to 12 in.		.62	.47
Extra Heavy Iron Pipe, Plain Ends.			
$\frac{1}{2}$, $\frac{3}{4}$ and $\frac{1}{2}$ in.		.62	.40
$\frac{1}{2}$ to 4 in.		.59	.47
$\frac{1}{2}$ to 8 in.		.55	.42

Boiler Tubes.—We note an active demand for both Locomotive and Merchant Tubes, some of the mills not actively seeking orders, having their product entirely sold up for several months. We are advised that official discounts are being firmly held as follows:

Boiler Tubes.	Iron.	Steel.
1 to $1\frac{1}{4}$ in.	.42	.47
$1\frac{1}{4}$ to $2\frac{1}{4}$ in.	.42	.59
$2\frac{1}{4}$ in.	.47	.61
$2\frac{1}{4}$ to 5 in.	.52	.65
6 to 13 in.	.42	.59
$2\frac{1}{4}$ in. and smaller, over 18 ft. long, 10 per cent. net extra.		
$2\frac{1}{4}$ in. and larger, over 22 ft. long, 10 per cent. net extra.		

Coke.—The demand for Furnace Coke is considerably better than for some time, and this, coupled with the fact that output is being restricted to some extent by scarcity of labor, has resulted in better prices. Strictly Connellsville Furnace Coke for prompt delivery is somewhat hard to find, and brings \$2.60 to \$2.65 a ton, at oven. Connellsville 72-hr. Foundry Coke for prompt shipment is quoted at \$3 to \$3.15, at oven, and we note that one consumer has contracted for his supply of Foundry Coke for the balance of the year with a leading Coke interest at \$3.15, at oven. High Sulphur Furnace Coke is offered at \$2 to \$2.25, at oven. The output continues heavy, the Upper and Lower Connellsville regions having made last week about 405,000 tons.

Iron and Steel Scrap.—The market is practically stagnant, and prices are weak, with a decided tendency to lower values. Consumers believe that by holding off they will be able to get material at lower prices later on, and as a result they are not buying or else are taking in only small lots to cover immediate wants. There is a good deal of Scrap pressing on the market. From the fact that practically no material is selling, it is somewhat difficult to give prices, but dealers are quoting about as follows: Heavy Steel Scrap, \$17.75 to \$18, for Pittsburgh, Steubenville or Sharon delivery; No. 1 Railroad Wrought Scrap, \$17.25 to \$17.50; Re-rolling Rails, \$18.25 to \$18.50; No. 2 Wrought Iron Scrap, \$17 to \$17.25; Bundled Sheet Scrap, \$15.75 to \$16; No. 1 Busheling Scrap, \$17 to \$17.25; No. 2, \$13.75 to \$14; Old Steel Rails, short pieces for Open Hearth use, \$17.75 to \$18; Low Phosphorus Melting Stock, \$22; Cast Iron Borings, \$13.25 to \$13.50; No. 1 Cast Scrap, \$20; Grate Bars, \$15.75 to \$16; Stove Plate, \$15.75 to \$16; Steel Axles, \$22.25 to \$22.50; Old Car Wheels, \$25. All these prices are per gross ton, f.o.b. buyer's mill, Pittsburgh, unless otherwise stated.

Cincinnati.

FIFTH AND MAIN STS., August 7, 1907.—(By Telegraph).

Pig Iron.—If there is any change in the situation from what it was a week since, it is so slight as to be scarcely discernible. There appears to be an utter absence of buying, excepting, perhaps, the usual run of small orders, which are always more or less in evidence, and which have no signal bearing upon general market conditions. There appears to be no disposition shown either on the part of producers or consumers to take any steps that would change the condition of affairs, and the probabilities are that the market will continue to drift along at a quiet pace until it is definitely ascertained what percentage of consumers is actually covered for the remainder of the current year, and what supply is available to meet this demand. Most of the agencies report the receipt of telegraphic requests asking that shipments on contracts be hurried forward, which would seem to be a fair indication that the melt is keeping up to normal, and also that founders generally are retaining the major part of the business booked a number of months since. There is still some resale Iron on the market, which perhaps has a tendency to keep the price on spot business at a minimum. The table of prices this week shows a slight decrease from those that have preceded it, and indicates \$20.50, Birmingham, as the ruling quotation on No. 2 Southern Foundry at this time. It is safe to say, however, that \$20 can be done under certain conditions, yet the former figures more nearly represent the true state of the market to-day. There is but one inquiry reported, and that comes from Louisville territory, and is for 1000 tons of No. 2 Foundry, No. 2

Soft, and No. 3 Foundry, for August and September delivery. Freight rates from the Hanging Rock District to Cincinnati are \$1.20, and from Birmingham, \$3.25. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	\$23.75 to \$24.25
Southern Coke, No. 2	23.25 to 23.75
Southern Coke, No. 3	22.75 to 23.25
Southern Coke, No. 4	22.00 to 22.50
Southern Coke, No. 1 Soft	23.75 to 24.25
Southern Coke, No. 2 Soft	23.25 to 23.75
Southern Coke, Gray Forge	20.75 to 21.25
Southern Coke, Mottled	19.75 to 20.25
Ohio Silvery, 8 per cent. Silicon	23.65 to 30.15
Lake Superior Coke, No. 1	22.65 to 24.15
Lake Superior Coke, No. 2	23.15 to 23.65
Lake Superior Coke, No. 3	22.65 to 23.15

Car Wheel Irons.

Standard Southern Car Wheels	\$29.00 to \$29.50
Lake Superior Car Wheels	27.50 to 28.00

Coke.—There is little new business moving. Operators in certain districts are said to have their entire output sold for many months ahead, and are not soliciting new business to any great extent. Prices are unchanged. We quote best brands of Connellsville and Virginia Foundry \$3 to \$3.25, f.o.b. ovens.

Finished Iron and Steel.—The demand for Structural Shapes continues heavy and deliveries are slow. Conditions generally show no material change from a week since, with prices unchanged. We quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.80c., with half extras; small lots from store, 2c., with full extras. Steel Bars, carload lots, 1.75c., half extras; smaller lots from store, 1.95c., with full extras. Base Angles, carload lots, 1.85c. Beams and Channels, carload lots, 1.85c., base. Plates, $\frac{1}{4}$ -in. and heavier, carload lots, 1.85c., base, and smaller lots from store, 2.25c. Sheets, No. 16, carload lots, 2.05c., and smaller lots from store, 2.60c.; No. 14, carload lots, 1.95c., and smaller lots from store, 2.50c. Steel Tire, 1 x $\frac{1}{4}$ in. or heavier, 1.95c., in carload lots.

Old Material.—The market is quiet, Scrap being in light demand. Dealers are said to have a plentiful supply on hand, but are holding for developments. We quote dealers' prices, f.o.b. Cincinnati, as follows:

No. 1 R. R. Wrought, net ton	\$16.50 to \$17.00
Cast Borings, net ton	9.00 to 9.50
Steel Turnings, net ton	12.00 to 12.50
No. 1 Cast Scrap, net ton	17.50 to 18.00
Old Iron Axles, net ton	25.50 to 26.00
Old Iron Rails, gross ton	24.00 to 24.50
Old Steel Rails, long, gross ton	17.50 to 18.00
Relaying Rails, 56 lb. and up, gross ton	27.50 to 28.00
Old Car Wheels, gross ton	24.00 to 24.50
Low Phosphorus Scrap, gross ton	19.50 to 20.00

Cleveland.

CLEVELAND, OHIO, August 6, 1907.

Iron Ore.—In spite of the strike that tied up the three ports at the head of Lake Superior for two weeks the Ore shipments up to August 1 were over 500,000 tons ahead of the shipments up to the same date last year. A better showing in shipments was made in July than had been expected. While the movement for the month showed a loss of over 1,500,000 tons compared with June, shipments were only 913,155 tons behind July, 1906. The heavy loss in shipments from the head of Lake Superior during July was cut down by big gains in the movements from Marquette, Escanaba and Ashland. The total movement from the mines up to August 1 was 17,534,741 tons, against 17,004,368 for the corresponding period last year. Work was resumed August 1 on all the docks that had been tied up, but the work of loading vessels has been slow since the strike was settled, and while Ore is now coming down in fairly good shape it will be the end of this week before things get back to their normal basis. Because of the delay of about 10 days in getting Ore moving rapidly the shipments during August are not expected to show much gain over August, 1906, when shipments were 5,665,815 tons. The strike is expected to result in a very heavy Ore movement during the latter part of the season. During the strike considerable Ore that had been piled on the docks at Lake Erie ports was moved to the furnaces. Ore prices are very firm, and there is an occasional sale of a small tonnage. Prices are as follows, at Lake Erie docks, per gross ton: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range non-Bessemer, \$4.25; Mesaba non-Bessemer, \$4; Siliceous Bessemer, \$2.75; Siliceous non-Bessemer, \$2.35 to \$2.60.

Pig Iron.—There is a slight improvement in the demand for Foundry Iron for spot shipment, but otherwise the market is the same as a week ago. The only sales have been in small lots to foundries that have run a little short. A Toledo furnace reports further sales at \$23.50 for No. 2 Foundry for spot shipment. This furnace has sold all its spot Iron, and has withdrawn from the market temporarily on Iron for quick delivery. The supply about equals the demand, so that the furnaces are having no trouble in disposing of their spot Iron, and the foundries find no difficulty in buying what they need. Some sales of No. 2 Foundry

Iron for last quarter delivery are reported at prices ranging from \$23, at furnace, to a minimum of \$22.50. Spot sales, Valley furnace, are noted at \$23 for No. 2. For forward delivery we quote No. 2 Foundry Iron at \$22.50, Valley furnace. There is no buying of Foundry Iron for 1908 delivery. Occasionally a foundry asks for prices and is given a quotation of \$21.50 for No. 2, but furnaces are making no efforts to make sales, and some of them are advising their customers to defer purchases until a market price is established for the first half of next year. Some of the smaller consumers of Foundry Iron have not covered for the last quarter, and a little more active market is looked for soon. Foundries are all busy, and the most of them are melting their Iron as fast as it comes from the furnaces. Some of the furnaces are still somewhat behind on deliveries. The Basic Iron situation is very quiet, and no sales are reported. Quotations for the fourth quarter of 1907, f.o.b. Cleveland, are as follows:

Bessemer	\$23.40
Northern Foundry, No. 1	23.50
Northern Foundry, No. 2	23.00
Northern Foundry, No. 3	22.50
Gray Forge	22.00

Coke.—The market is firmer, and the demand is better. Makers of a number of the better grades of Foundry Coke are reported sold out for the balance of the year. We quote 72-hr. Connellsville Foundry Coke for the balance of the year delivery at \$3.15 to \$3.25, at oven. Furnace Coke on contract is quoted at \$2.50 to \$2.60, at oven.

Old Material.—The market is fully as dull as it has been for the past month, and the prospects for an improvement soon do not look bright. Prices are a shade weaker than last week, although no change is noted in the quotations, which are largely nominal. The only transactions have been a few small sales to mills to supply immediate needs. Consumers are apparently expecting a further decline in prices, and for that reason are not placing contracts for future delivery, although the mills in this territory are said to have pretty well used up the Scrap they have coming under contract. Dealers are well supplied and are refraining from making further purchases until the demand improves. The Big Four Railroad has a list out of about 1000 tons. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	\$16.50 to \$16.75
Old Iron Rails	24.00 to 24.50
Steel Car Axles	21.50 to 22.00
Old Car Wheels	23.00 to 24.00
Relaying Rails, 50 lb. and over	29.00 to 31.00
Relaying Rails, under 50 lb.	31.00 to 32.50
Heavy Melting Steel	16.00 to 16.50
Railroad Malleable	18.75 to 19.25
Agricultural Malleable	15.50
Light Bundled Sheet Scrap	14.50 to 15.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	\$26.00 to \$27.00
Cast Borings	10.50 to 11.00
Iron and Steel Turnings and Drillings	12.50 to 12.75
Steel Axle Turnings	14.00 to 15.00
No. 1 Busheling	14.50 to 15.00
No. 1 Railroad Wrought	16.00 to 16.50
No. 1 Cast	18.00 to 19.00
Stove Plate	15.00 to 15.50
Bundled Tin Scrap	10.00

Finished Iron and Steel.—A contract for 7200 tons of Plates and Shapes was placed during the week by the American Shipbuilding Company, with the leading interest, for two more lake boats, for which contracts have just been closed. This makes a total of over 35,000 tons of Plates and Shapes that have been contracted for in the local market during the past few weeks by two shipbuilding companies for boats for 1908 delivery. Outside of these contracts only a small amount of business has been placed, and nearly all the orders were small. Specifications for all kinds of Finished Material continue to come in in good shape, although some of the mills report them not as heavy as in the two or three preceding weeks. There is a heavy demand for Structural Material, and the specifications are heavier than for other lines. The Bar Iron market is weaker. Local mills are quoting Iron Bars at 1.65c., Cleveland, for Western trade. The local mills are well filled with orders, but can make reasonably prompt shipment, if desired. Other mills are quoting Iron Bars on the basis of 1.60c. to 1.65c., Pittsburgh, or 1.70c. to 1.75c., Cleveland, the lower price being made for desirable orders. Steel Bars are still in good demand on contracts and deliveries are not promised within 10 to 16 weeks. We quote Steel Bars for future delivery at 1.70c., Cleveland, for carload lots. Mills doing a premium business report a good demand for Plates, at a premium of \$2 a ton for quick shipment. There is some demand for Forging Billets in carload lots. For small sizes of Forging Billets for prompt shipment we quote \$36 to \$38, Cleveland, for car lots. The mill price on Beams and Channels is 1.80c., base, for carload lots, Cleveland. The warehouse price is 2.25c. Warehouse business in all kinds of Finished Material is good, being somewhat heavier than it was during July. No change is noted in stock prices. We quote Steel Bars out of stock at 1.95c., and Iron Bars at 2c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.30c.; No. 28 One Pass Cold Rolled, 3.05c.; No. 28

Galvanized, 4.05c. The warehouse price on Boiler Tubes, 2½ to 5 in., is 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

New York.

NEW YORK, August 7, 1907.

Pig Iron.—During the week there has been more activity, and it is estimated that about 15,000 tons of Pig Iron has been marketed, in fair sized blocks, to Pipe shops and to foundries. It has been necessary, however, to make lower prices, and the market is irregular and rather weak. Very little is being done in Basic Iron. We quote for Northern Irons, at tidewater, \$22.75 to \$23.25 for No. 1 Foundry, \$21.50 to \$22 for No. 2 Foundry, and \$20.50 to \$21 for No. 2 Plain. Southern Iron, on the basis of Birmingham figures, is nominally \$24.50 to \$25, which, of course, excludes it completely from this market.

Steel Rails.—Large business in Standard Rails is still lacking, and it may be fall before the situation clears up and an understanding is reached as to the price to be paid for the more expensive mill operations contemplated. Some business has been done with switch and crossing companies, 6000 tons for 1908 delivery and 2100 tons for this year being reported by one interest. The Central Illinois Construction Company has taken 3500 tons of Standard Rails, and the Idaho & Northern 6000 tons for delivery next year. Among this year's business is reported 5000 tons for the Northwestern Pacific Railway and 2000 tons for the Great Southern Lumber Company.

Structural Material.—The principal New York City business closed in the past week is 10,000 tons for the Edison Company's power station, taken by the J. B. & J. M. Cornell Company. Of work pending the additional Chelsea piers and pier sheds, for which the city will open bids this month, are of chief interest. The tonnage will be about 13,000, and later in the year further work of the same character is to be let. The New Haven road has been steadily putting through its various improvements in recent months. New Bedford track elevation, for which the latest bids were received, calls for about 1000 tons of Steel. The Bay Chester bridges, which were the last work let on the Harlem Division improvement, were taken by L. F. Shoemaker & Co., and amounted to about 900 tons. Generally the local situation is quiet, though throughout the country it is estimated that 75,000 tons in industrial, office and other buildings is pending. The American Bridge Company's July business was 46,000 tons, the largest total for July, with the single exception of that month in 1905. Structural mills report that deliveries on an average order involving a number of sizes are not as prompt to-day as was the case a few weeks ago, and, on the whole, conditions are considered very satisfactory. We quote, as follows, on tidewater deliveries, shipments from mills: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.90c.; Bulb Angles and Deck Beams, 2c. On Beams 18 to 24 in. and Angles over 6 in. the extra is 0.10c. Sales are made out of stock, of material cut to length, at 2¼c. to 2½c.

Bars.—The demand for Bar Iron is somewhat better, orders being more generally distributed, but the quantities named are not large, as buyers are cautious in their commitments, and are not anticipating their requirements. Prices of Best Refined are quotable at 1.60c. to 1.65c., Pittsburgh, or 1.76c. to 1.81c., tidewater. Steel Bars are selling at 1.76c., tidewater, for distant delivery, but for reasonably early shipment buyers are obliged to pay 1.86c. or higher.

Plates.—Universal Plates are locally in much greater demand than Sheared Plates, and so much business in the former has recently been booked that the Eastern mills are no longer making deliveries in a couple of weeks. Small orders for Sheared Plates are fairly numerous and conditions are regarded as rather satisfactory for the season. Quotations as firm, as follows, for tidewater delivery: Sheared Tank Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—The city of New York will purchase about 3000 tons within the next two weeks and will take a very large quantity in the near future after the necessary official approval is given to financial matters which are now in course of arrangement. A fair trade is being done in carload lots but consumers generally are showing little disposition to enter the market. Practically everything now ordered is for absolute necessities. The foundries are still well supplied with work, but would naturally like to see more new business coming forward. Carload lots of 6-in. pipe are quoted at \$34.50 to \$35 per net ton, at tidewater.

Old Material.—As stated last week, the embargoes on shipments to the principal Steel mills in eastern Pennsylvania in July had a somewhat demoralizing effect on the market and any Old Material that had to be moved during that time was sold at reduced prices. These embargoes have all been lifted, and there are now numerous inquiries in the market, but the tonnage is small. The current demand is more

especially for Stove Plate, Wrought Pipe and good Heavy Turnings. Leading dealers are of the opinion that bottom has about been reached, and that a buying movement of any volume would create a decided improvement, because the accumulation of stock in dealers' hands is quite light as compared with previous years. The high prices prevailing for the whole of the first six months of the year had the effect of enabling dealers to clean up everything they had. All the rolling mills have been out of the market for more than 60 days, and most of the eastern Pennsylvania mills have heavily reduced their stocks. It would, therefore, not be surprising to see prices stiffen up somewhat before the close of August. We quote, per gross ton, f.o.b. New York, as follows:

Old Girder and T-Rails for melting.....	\$14.00 to \$14.50
Heavy Melting Steel Scrap.....	14.00 to 14.50
Old Steel Rails, rerolling lengths.....	16.50 to 17.00
Relaying Rails.....	26.00 to 26.50
Old Iron Rails.....	21.50 to 22.00
Standard Hammered Iron Car Axles.....	27.50 to 28.00
Old Steel Car Axles.....	18.00 to 19.00
No. 1 Railroad Wrought.....	17.00 to 17.50
Iron Track Scrap.....	15.00 to 15.50
No. 1 Yard Wrought, long.....	15.00 to 15.50
No. 1 Yard Wrought, short.....	14.50 to 15.00
Light Iron.....	9.00 to 9.50
Cast Borings.....	11.00 to 11.50
Wrought Turnings.....	13.00 to 13.50
Wrought Pipe.....	13.00 to 13.50
Old Car Wheels.....	21.00 to 22.00
No. 1 Heavy Cast, broken up.....	17.00 to 17.50
Stove Plate.....	14.00 to 14.50
Grate Bars.....	12.00 to 12.50
Malleable Cast.....	17.00 to 17.50

Metal Market.

NEW YORK, August 7, 1907.

Pig Tin.—Consumers who have been holding back their purchases with the expectation of seeing lower prices are having their hopes realized, for during the week under review values receded materially. The balance of opinion in the metal trade leans toward still further reductions, it being held that the statistical position and the lack of support in London foreshadow a continued fall of the market, owing to its own weight. Certain New York interests, it is surmised, with speculative intent, seemed to think that the bottom was reached yesterday, for, after a period of almost absolute quietude, so far as transactions were concerned, about 200 tons changed hands. If it was expected that this business would deter the downward movement the principals were mistaken, as the London market opened up to-day £3 15s. below yesterday's closing cable on spot, and £3 10s. lower on futures. The Banca sale, which was consummated on July 31, at equivalent to 40.50c. c.i.f. New York, did not have the strengthening effect expected. On that day spot Tin was quoted here at 40.25c., and Tin due in six days from that date on the steamer Minnehaha was quoted at 40.10c. This steamer, by the way, arrived yesterday with 480 tons, almost all of which is sold. A goodly portion of that sold is not to go directly into consumption, however, it having been purchased speculatively for resale. The price of spot Tin on August 1 was 39.95c., and the price of Minnehaha Tin dropped to 39.60c. The next day a still further drop in the price of spot brought it to 39.60c. and the premium on futures disappeared, as Minnehaha remained unchanged. In the absence of London quotations on Saturday, it being a bank holiday, no attempt at business was made here. This gave speculative interests an opportunity of bidding up the prices a bit on Monday morning, when 39.90c. was named for spot, and 39.70c. for the Minnehaha metal. Yesterday, the only day of the week witnessing any business, there was considerable astonishment over the sale of some 200 tons at prices ranging from 39.50c. to 39.60c. In spite of this streak of good business the London market showed a decline at the opening to-day, the price of spot being £174 15s., while futures were quoted at £174 10s. As stated previously, these figures are £3 15s. and £3 10s., respectively, lower than the closing quotations of yesterday. As compared with the closing quotations of a week ago to-day they show respective declines of £7 5s. and £7 10s. Since the first of this month the arrivals have amounted to 598 tons and the "afoats" are figured at 1840 tons. The next steamer due is the Mesaba, carrying about 200 tons, and calculated to arrive on the 14th inst. At the close to-day London recovered a shade, cables naming £174 17s. 6d. for spot, and £174 12s. 6d. for futures. Closing prices here were as follows: Spot, 38.60c. to 39c.; August, 38.60c., to 38.72½c.; September, 38.25c. to 38.50c.; October, 38c. to 38.50c. The market is weak here, but characterized as steady by the closing London cable. According to the statistics compiled by C. Mayer, secretary of the New York Metal Exchange, the total visible supply in Europe and America on July 31, 1907, was 841 tons above that of July 31, 1906, but only 27 tons above that of December 31, 1906.

* **Copper.**—There is little room for the bull on the Copper situation in this market to-day. Everything seems to be going against any hope for a strong market, and, in fact, in-

dications all point to a continued slump, despite the heroic efforts of the largest producers. Naturally, in a market such as this, there are plenty of predictions of how low the market is going. Certain metal merchants, whose opinions are highly respected, argue that prices will recede to the level of two years ago, when Copper was commanding but 15c. The expectation that the metal will soon fall to 18c. is very general in the trade. At any rate, present prices seem to offer no inducement to the consumer, who is still covering his absolute requirements on a hand to mouth basis, and bringing into the market a very, very meager amount of business even at that. One report current in the trade has it that a meeting is scheduled for Friday of this week, at which the selling organization of the chief Electrolytic and high grade producer and the most prominent Lake producer will be represented for the purpose of considering ways and means of "preventing the prices from dropping to 14c." This report is, of course, unconfirmed. One of the parties concerned has, however, been reported to be offering the metal at prices somewhat below the "official," though generally conceded, nominal prices of the "principal producers." The fallacy of these "official" quotations is apparent when it is considered that to-day's price of Best Selected in London is equivalent to 18½c., London. Throughout the entire week business has been practically nil. Every effort to sound the market disclosed fresh weakness in values, and to-day's close finds a weak and nominal market with plenty of metal available at the following prices: Lake, 19.50c. to 20.50c.; Electrolytic, 19c. to 19.50c.; Casting, 18.50c. to 19c. The London market showed a slight recovery at the close as compared with the earlier cable, final quotations being as follows: Spot, £83; Futures, £80 15s.; Best Selected, £89. Exports so far this month have been small, amounting only to 1971 tons. During the month of July exports were only fair, the total as compiled by C. Mayer, secretary of the New York Metal Exchange, being 14,646 gross tons. The total exports for the seven months of this year show a decrease of 22,914 tons, as compared with the same period of last year. The total exports from January 1, 1907, to July 31, 1907, exclusive of Southern and Pacific ports for July, amounted to 97,160 tons, as against 120,074 tons for the same period of 1906.

Pig Lead.—The expected "official" reduction in price has not yet been made. It is being anxiously awaited in all quarters of the trade, however, and may be announced at any moment. Outside lots of spot are offered at a considerable reduction, although St. Louis telegraphs an unchanged market. Spot may be had at 5.15c. here, and St. Louis is still quoting 5c. London cables £19 2s. 6d.

Spelter.—Prices have declined here and in St. Louis. The metal may be had here at prices ranging from 5.80c. to 5.90c., and in St. Louis there are sellers at 5.75c. London cables £22.

Ferroalloys.—The demand for Ferroalloys has improved somewhat. Fifty per cent. Ferrosilicon is held at \$104, but sales have been made at slightly better figures, where quick delivery of large lots could be guaranteed. Ferromanganese is dull and unchanged, being quoted at \$61 to \$63, Pittsburgh.

Tin Plate.—New business is light, and shipments are coming forward more rapidly. Prices are without change, at \$3.90, f.o.b. Pittsburgh, and \$4.00, f.o.b. New York, for 100-lb. IC Coke Plates.

Antimony.—Prices are a shade lower, and business is unimproved. Cookson's can be had at 11c., Hallett's at 10c., and outside brands at 9c.

Old Metals.—Business in old metals is almost at a standstill. Prices of all lines containing Copper have suffered still further reductions, but in the absence of business, almost all figures are nominal. Dealers' selling prices are, approximately, as follows:

	Cents.
Copper, Heavy Cut and Crucible.....	18.75 to 19.00
Copper, Heavy and Wire.....	18.25 to 18.50
Copper, Light and Bottoms.....	16.50 to 16.75
Brass, Heavy.....	12.00 to 12.25
Brass, Light.....	9.50 to 10.00
Heavy Machine Composition.....	16.25 to 16.50
Clean Brass Turnings.....	12.00 to 12.50
Composition Turnings.....	14.00 to 14.50
Lead, Heavy.....	4.75
Lead, Tea.....	4.37½
Zinc Scrap.....	4.75

Iron and Industrial Stocks.

NEW YORK, August 7, 1907.

For the greater part of the past week transactions on the Exchange were extremely light, and in some stocks several days passed with no sales recorded. On Monday a decided selling movement developed which was attributed to the sinister influence of the huge fine imposed upon the Standard Oil Company of Indiana by Judge Landis, of the United States Court, Chicago. This movement carried prices down still lower on Tuesday and this morning. The range of prices on active industrials from Thursday of last week

to Tuesday of the present week was as follows: United States Steel common 33¼ to 35¾, preferred 99¼ to 100¾; Car & Foundry common 40¾ to 43; Locomotive common 55¼ to 57; Steel Foundries preferred 36¼ to 38; Colorado Fuel 27½ to 31; Pressed Steel common 30 to 33½, preferred 90 to 93; Railway Spring common 39½ to 40; Republic common 25 to 26½, preferred 81¼ to 83¼; Sloss-Sheffield common 51¼ to 55; Cast Iron Pipe common 33½ to 36. Last transactions up to 1.30 p. m. to-day are reported at the following prices: United States Steel common 33, preferred 97½, ex-div.; Car & Foundry common 40¼, preferred 100; Locomotive common 55, preferred 105¾; Steel Foundries common 6½, preferred 33; Colorado Fuel 27½; Pressed Steel common 29½, preferred 91; Railway Spring common 39; Republic common 24, preferred 80; Sloss-Sheffield common 53; Tennessee Coal 140; Cast Iron Pipe common 33, preferred 81; Can common 5½, preferred 51¾.

F. J. Lisman & Co., New York, are offering on a 6½ per cent. basis, \$1,100,000 of 5 per cent. car trust bonds of the Boomer Coal & Coke Company, due serially, one-tenth each year, on July 15, 1908, to 1917. They are secured by 1000 steel drop bottom 50-ton coal cars, costing \$1,265,000, and the coking coal property of the Boomer Coal & Coke Company, and are also unconditionally guaranteed as to principal and interest by M. A. Hanna & Co., of Cleveland. The property consists of 4000 acres at Boomer, Fayette County, W. Va., and is controlled by M. A. Hanna & Co., the Solvay Process Company, of Syracuse, N. Y.; the By-Product Coke Corporation, of Chicago, and the Milwaukee Coke & Gas Company, of Milwaukee.

Dividends.—The Virginia Iron, Coal & Coke Company has declared a stock dividend of 5 per cent., October 1.

Labor and Wages in Canadian Industries.

TORONTO, August 3, 1907.—Another bulletin relating to manufacturing statistics has been issued by the Census Bureau of Canada. The facts it presents pertain to the number and wages of employees engaged in the manufacturing industry in 1905, as compared with 1900. "Employees" comprehend officers, clerks, workers, in fact, all persons who receive salaries or wages in manufacturing service. In 1900 there were 344,035 persons thus employed, their total remuneration being \$113,249,350. In 1905 the employees were 391,489 in number, and their total remuneration was \$164,394,490. In 1900 the value of product per employee was \$1.398, and in 1905 it was \$1.832. The occupations that afford work for the greatest number of wage earners are those grouped under the head of log products and lumber products. These together give employment to 68,280 persons. In foundry and machine shops 17,928 are engaged. The following items are those of most interest to readers of *The Iron Age*:

	1900.		1905.	
	Wage earners.	Salaries.	Wage earners.	Salaries.
Agricultural implements...	6,834	\$3,057,000	7,478	\$3,778,804
Axes and tools.....	1,053	448,275	2,128	1,078,229
Bicycles	512	232,617	256	132,057
Boilers and engines.....	4,028	1,845,574	2,500	1,369,285
Brass castings.....	901	404,466	649	330,840
Bridges, iron and steel....	874	391,696	1,370	849,846
Carriages and wagons....	5,466	2,256,456	5,241	2,451,505
Car repairs.....	5,811	2,835,508	8,957	4,845,899
Cars and car works.....	3,147	1,286,129	7,755	3,746,219
Cement, Portland.....	558	221,514	1,414	703,079
Electrical apparatus.....	2,021	950,551	4,806	2,498,905
Iron and steel products....	4,316	1,924,432	5,580	2,567,914
Foundry and machine shops.	12,947	5,584,767	17,928	9,145,572
Gas machines.....	29	11,776	79	36,736
Oils	669	331,241	903	498,924
Paints and varnishes.....	638	332,521	878	452,010
Plumbers' supplies.....	486	208,365	1,258	650,695
Plumbing and tinsmithing.	4,447	1,855,445	6,807	3,316,817
Roofing and roofing materials	154	81,416	525	306,423
Sewing machines.....	637	300,362	461	215,854
Ships and ship repairs....	2,528	835,517	1,672	766,272
Smelting	2,113	1,331,553	9,849	6,648,400
Wire	687	240,861	1,222	544,400

It will be seen that the industries having most to do with construction show marked increases in the number of persons employed. In axes and tools the number is doubled. In iron and steel bridges the number of hands has increased 60 per cent. In car repair works there is an increase of more than 50 per cent. The men employed in car manufacture have more than doubled. Those employed in the making of Portland cement have nearly

trebled. The making of electrical apparatus, due to power installments, has called for five men wherever two were engaged before. In the manufacture of iron and steel products the expansion has not been notable, 5580 hands being employed in 1905, as against 4316 in 1900. Of all the industries, smelting shows the greatest growth, the 2113 hands occupied in it in 1900 having swollen to 9849 in 1905. The foundry and machine shop business has also been as progressive as the supply of labor would permit, as it kept 17,928 workers busy in 1905, as against 12,947 in 1900.

C. A. C. J.

A Demand by New York Machinists.

The International Association of Machinists has made a demand upon employers in New York City and vicinity for an advance of 25 cents a day. The formal notice served last week asked that the new rate become effective August 1. The New York and New Jersey Branch of the National Metal Trades' Association, in the membership of which are concerns employing about 2800 machinists, referred the demand to its Executive Committee, which will make reply to the officers of the union, but has not yet formulated its answer. The Amalgamated Society of Engineers, the British union of machinists, which has some membership in New York and vicinity, unites in asking the advance. Union officers say that more than 15,000 machinists in New York and outlying districts, including New Jersey, will be affected by the advance. An 8-hr. day has been declared for by the New York district machinists, but that issue is not raised with the employers. The statement is made by the men that if the demand for higher wages is refused they will strike for more wages and the shorter day at once.

The Report of the German Steel Syndicate.—The annual report of the Stahlwerks-Verband, just issued in pamphlet form, which reviews the development of the business of the syndicate, contains some interesting figures. Since the syndicate has been frequently reproached with having discriminated against home consumers of steel billets, the syndicate shows how the quantities delivered to the German market have increased. For the fiscal years beginning March 1 to February 28 the deliveries were:

	Metric tons.
1902-1903.....	737,621
1903-1904.....	844,629
1904-1905.....	1,042,688
1905-1906.....	1,293,480
1906-1907.....	1,335,223

The total shipments of billets during the fiscal year 1905-1906, figured by ingot equivalent, were 1,996,779 tons. During the fiscal year 1906-1907 they delivered 1,795,328 tons, a falling off of 201,451 tons. Of this quantity only 18.43 per cent. was shipped to foreign countries, while in the fiscal year 1905-1906 the export shipments were 27.39 per cent. of the larger total.

The shipments, expressed in the equivalent of steel ingots, were as follows during the last fiscal year from April, 1906, to March, 1907:

	Prior to syndicate.		Syndicate.		Totals.
	Domestic.	Export.	Domestic.	Export.	
	Tons.	Tons.	Tons.	Tons.	Tons.
Billets	104,851	10,418	1,359,614	320,445	1,795,328
Track material.	13,093	53,704	1,350,157	616,283	2,033,237
Shapes		578	1,435,461	492,193	1,928,232

The figures given under the heading "Prior to Syndicate" represent the shipments made during the fiscal year by concerns which have since joined the syndicate. The export figures are interesting. The report contains a series of diagrams showing for the last three years the allotments and the shipments, monthly, of the various products.

Reports that the United States Steel Corporation is negotiating for the purchase of the blast furnace of the Midland Steel Company at Beaver, Pa., are officially denied. There have been no negotiations between the two interests with a view of changing the ownership of this furnace.

The Machinery Trade.

NEW YORK, August 7, 1907.

So many are away on vacation, the much depleted forces in the machinery houses are kept busy taking care of the business that is coming in. With some the past week has shown an increase in sales over the previous week or two, and all report a good, steady trade. This consisted almost wholly of small lots of tools, no large transactions being reported; nor were any substantial lists of tools reported as being sent out since our last report. Some time ago we mentioned that buyers would become more active as soon as deliveries eased up and the dealers could show a more complete stock of tools on their floors. This now seems about to be realized, judging from the number of small railroads that have lately come into the market. Deliveries have eased up a little on some machines, one manufacturer being able to make shipment the last of September. This has induced much small buying, and since the large railroad systems have apparently placed most of their large business the smaller roads are coming into the market more freely. In the trade it is stated that the smaller railroads require a good aggregate of machine tools and that one is making up a list of its requirements.

An important feature of the Industrial Exposition at Tokio, Japan, which was closed last month, was the display of American machine tools. Manufacturers here who were asked by Japanese exporting houses to contribute to the exposition made extra efforts to be represented, regardless of the pressing demand for ready machines for early delivery. In consequence the showing of American machine tools was especially large, and one of the biggest line of manufacturing equipments from this country was shown by Takata & Co., who recently formulated a selling alliance with Manning, Maxwell & Moore. This firm had about 3400 sq. ft. of space, a large part of which was given over to the display of American machinery. Among the companies whose equipment was shown were the Westinghouse Electric & Mfg. Company, Westinghouse Machine Company, American Radiator Company, J. G. Brill Company, Lombard Governor Company, Locke Insulator Company, Burt Mfg. Company and a large majority of the machine tool houses having connections with Takata & Co.

The American Saw Company has been organized by interests closely connected with the American Sawmill Machinery Company, to manufacture saws at Hackettstown, N. J. The company has been given a tract of land of about 3 acres by the Hackettstown Board of Trade, and it is the intention to equip it with modern machinery and start manufacturing as soon as possible. The company is incorporated under the laws of the State of New Jersey, with a capital of \$1,000,000, and the incorporators are Edward A. Simmons of New York, and Robert H. Richard and William E. Swanger, both of Hackettstown. Mr. Swanger, Hackettstown, N. J., is in charge of details of erection and equipment of the plant, and he will probably do the machinery buying.

The Newburg Ice Machine & Engine Company, Newburg, N. Y., which is closely allied with the Alberger Condenser Company and the Alberger Pump Company, 85 Liberty street, New York, is constructing a large erecting shop and an addition to its foundry, which, it is understood, when completed will be used for the manufacture of the new line of Alberger pumps. Little if any ice machinery has been made in the plant of late, and it is being utilized largely for the building of pumps of an improved pattern. The new erecting shop is about 60 x 310 ft. The company's foundry extension consists of a 60-ft. addition to the present foundry, but later on it is understood the company intends to build a large new foundry, where all of its castings will be made. At present the company is having some of its castings made by other manufacturers. Orders have been placed for about 300 hp. of Babcock & Wilcox boilers, and the company has built engines of a sufficient capacity to take care of them.

The Stephenville, North & South Texas Railroad, Stephenville, Texas, will within the next 10 days commence the erection of a new machine shop at Stephenville, and will in the near future be prepared to equip it with tools, &c.

No machinery equipment has as yet been purchased by the National Cement Company, 1 Wall street, New York, for its plant to be erected at Carpentersville, N. J. The company's engineering department is now looking into the merits of various cement making appliances, and it has not decided as yet whether to use steam, gas or electricity to generate power. The company plans to build a mill at first with a capacity of 2000 barrels of cement a day, and later on it is intended to extend the plant so as to make about 10,000 barrels a day. The corporation was recently organized under a New Jersey charter, with \$2,000,000 paid in capital. Arrangements are now being made to extend the capital, and in addition to the Carpentersville project the corporation has a number of other enterprises in sight along the line of

cement production. Within the next few months it is expected this plan will develop and some extensive purchasing will follow.

Westinghouse, Church, Kerr & Co., 8 Bridge street, New York, are now placing orders for machinery equipment for the plant of the Ajax Portland Cement Company, Independence, Kan., which was mentioned in this column last week. A contract has been given to the H. N. Strait Mfg. Company for three Corliss engines, aggregating about 4000 hp. The machinery equipment now being purchased will be adequate to equip a mill producing about 3000 barrels of cement a day. Machinery is required for early shipment, and deliveries are to be made at Independence.

The list of machine tools mentioned in these columns two weeks ago as having been issued by the Hudson Companies for delivery at Jersey City or Hoboken has been closed, and the majority of the business was placed with the Niles-Bement-Pond Company. These tools do not cover the entire needs of the company for the shops they are intended for, it is understood, and it is expected before long a supplementary list will be sent out to the trade.

It is probable that the United States Leather Company, 28 Ferry street, New York, will shortly buy considerable equipment to replace that lost by fire on August 2 at the company's plant at Tomahawk, Wis., when the manufacturing buildings were burned to the ground. It is the company's intention, it is understood, to rebuild the plant as soon as possible, and before long it is thought the trade will hear of a considerable quantity of machinery requirements for the equipment of the new plant.

The Department of Public Charities, New York, will receive bids August 15 for the construction of a complete electric lighting and power system for the buildings in the City Hospital district on Blackwell's Island. On August 22 the department will receive bids on a similar equipment for the group of buildings comprising the City Home for the Aged and Infirm.

The Louisville Water Company, Louisville, Ky., will receive bids until September 8 for one compound beam and flywheel pumping engine of the Leavitt type, 16,000,000 gal. capacity; one compound beam and flywheel pumping engine of the Leavitt type, 20,000,000 gal. capacity; one vertical triple expansion crank and flywheel pumping engine, 24,000,000 gal. capacity. Bids will be received and considered for these three types of engines, but only one of them will be purchased. Bids are also desired for two horizontal fire-box tubular boilers, one vertical triple expansion crank and flywheel pumping engine of 24,000,000 or 30,000,000 gal. capacity, and one battery of two boilers similar to those now in use at the Crescent Hill pumping station.

The following bids for barge canal work, aggregating nearly \$7,000,000, were opened July 31: On contract No. 12, covering excavation and structures for about 43 miles between Oneida Lake and Mosquito Point Bridge across the Seneca River; No. 14, covering about 15 miles from Crescent Aqueduct to Mohawk Aqueduct, on the Mohawk, with dams at Visscher's Ferry and Canajoharie, and No. 35, on the Oswego Canal. On No. 12, which has been extended to cover nearly three times the work first advertised, when no bids were received, the only bid was that of the Stewart, Kerbaugh & Shanley Company, New York, \$3,391,716, which is \$309,156 above the engineer's estimate. On No. 14 the lowest of three bidders was Arthur W. Luce, New York, \$2,935,764, against the engineer's estimate of \$2,875,570. On No. 35 the lowest of two bidders was the Gilmour, Horton, Allen Company, Sandy Hill, \$752,261, against the engineer's estimate of \$752,760.

The Frevert Machinery Company, 18 Dey street, New York, which represents a number of well-known machine tool manufacturers in the New York district, has recently secured the agency for the Foster-Kimball Machine Company, Elkhart, Ind., maker of screw machines, turret lathes and brass finishing lathes; Superior Machine Tool Company, Kokomo, Ind., upright drill presses; Miami Valley Machine Tool Company, Dayton, Ohio, screw cutting lathes. These additional agencies will enable the company to cover a wider field, as it is in a position to offer a larger and more diversified line of machine tools.

Chicago Machinery Market.

CHICAGO, ILL., August 6, 1907.

While developments of the week in the machinery market include no transactions or inquiries of unusual importance, the prevailing quietness has at least not become more accentuated. Some improvement, in fact, is noticeable in certain directions. A number of machine tool dealers report sales which in the aggregate show an encouraging gain over those of recent weeks. No especial significance, however, is attached to this spurt of activity, since it is doubtless but an incident in the ups and downs that mark the usual course of trade. But the orders, coming in, as they do, from diversified industries and various sections of the country, are indi-

cative of conditions in manufacturing industries far removed from general dullness and lethargy. The fact, too, that it is now possible in many cases to secure prompt shipment of tools from dealers' stocks is effective in bringing out withheld orders. Touching this phase of the case, a representative of a large tool manufacturing interest expressed the opinion that the avalanche of orders produced by the extraordinary demand of the past two years had of itself barred the normal progress of trade. When it became necessary to anticipate the future to the extent of making commitments for deliveries running as far as 12 months ahead, conservative buyers very prudently began to hesitate. The pressure of such a demand, it was furthermore suggested, would, if much longer continued, have resulted in an overexpansion of productive capacities, and under such circumstances the inevitable reaction that always follows extremes in trade movements would have been all the more violent in its effects. Considered from this viewpoint, therefore, the check interposed by a season of comparative quiet such as now exists is rather to be welcomed than deplored. But for the buying of an occasional tool here and there the railroads are a negligible factor in the market. Evidently their purchases are being restricted to imperative needs.

The Chicago, Lake Shore & Eastern Railroad, controlled by the United States Steel Corporation and operating between the South Chicago plant of the Illinois Steel Company and the new Indiana Steel Company's works at Gary, Ind., has acquired a site at the latter place for the location of shops. New buildings for machine, blacksmith, repair shops and a roundhouse of 60 stalls will be constructed without delay. Full equipment for these plants will be purchased. This road, together with its related lines, is unimportant in extent of mileage, but when the great steel plant now being built at Gary is in operation it will handle an enormous traffic. Its shop plant will, therefore, necessarily be out of proportion in size to the mileage of the system.

The steel shop and car erecting shop of the Chicago, New York & Boston Refrigerator Company, Chicago, builder of refrigerator and other freight cars, together with several cars and material, were recently destroyed by fire. The mill and power house connected with the plant were not seriously damaged, and business was suspended only in the steel working end of the shop. The buildings destroyed will at once be replaced, and will be equipped with new machinery to take the place of that destroyed by fire.

The Sycamore Wire Fence Company, Sycamore, Ill., recently incorporated with a capital stock of \$100,000, has let contract for the erection of factory buildings, work upon which has already been begun. It is expected that the plant, which is of one-story saw tooth roof design, will be completed and ready for operation by September 1. The company is now in the market for machinery equipment, which will consist of shapers, lathe, planer, drill, shafting and hoists, and a 10-hp. motor. The Board of Directors is composed of M. C. Munn, John L. Storey, E. Rudolph Youngren, Wm. J. Kennedy and T. L. Oakland.

The Board of Trustees of the Sanitary District of Chicago is asking for proposals on auxiliary electrical equipment to complete the installation of a fifth generative unit in the hydro-electric power station on the drainage canal at Lockport, Ill. Materials and apparatus called for in the specifications include six electrically operated, remote controlled oil circuit breaker switches, for use on the 12,000-volt circuits running from the Western avenue sub-station; lightning arresters required for the protection of five 60-cycle 12,000-volt circuits; three switchboard panels of polished white Italian marble, mounted on rigid angle iron frame and furnished with a complete set of suitable instruments. Necessary conduits for the reception of wiring and cables required to connect properly three transformers and eight oil circuit breaking switches are to be installed. Proposals are also invited for the furnishing and erecting of approximately 30 miles of $\frac{1}{2}$ -in. galvanized seven-strand steel wire cable on the top section of steel transmission line poles between the Western avenue substation, Chicago, to the power house at Lockport. Thirty-three cast iron manhole covers with 15 steel frame cover supports will be required for the inspection tube openings over turbine chambers of the power house. Bids on the material and apparatus specified are, in each case, to include installation, and will be publicly opened on August 14. The work must be completed and ready for service by October 1. I. J. Bryan, American Trust Building, Chicago, is clerk of the board.

Bids are being asked by the Board of Commissioners, Chicago, for steam generative equipment to be installed in the County Hospital at Dunning, Ill. Plans and specifications prepared by Hollabird & Roche call for four 250-hp. water tube boilers, together with all necessary appliances and piping connection. Separate bids will be taken on grates for these boilers, the type of which is not specified. Both mechanical stokers and hand operated grates are being considered.

The power plant of the Pontiac Light Company, Pontiac, Mich., is to be remodeled and enlarged. The plans for this work are now being prepared by E. J. Bechtee, consulting engineer, which will include the installation of new boilers and generators.

The second addition to be made to the new plant of Pawling & Harnischfeger, Milwaukee, manufacturers of cranes, is now practically complete, and will be ready for occupancy by the end of August. This building is 100 x 355 ft., constructed of brick and steel. In consequence of the increased floor space and additional machinery it will be necessary to make corresponding additions to the power plant, and an Allis-Corliss 115-hp. compound engine, and an Allis-Chalmers 100-kw. dynamo, together with a 400-hp. Heine boiler and a Hawley down draft furnace, will be added. The boilers will then be able to deliver 1000 hp., and the dynamos 700 kw.

The Vilter Mfg. Company, Milwaukee, manufacturer of Corliss engines and refrigerating machinery, has received an order from the Rokuasha Company, Tokio, Japan, for a 30-ton refrigerating plant, to cost \$7500. The Rokuasha Company is one of the pioneer photograph paper manufacturing companies of Japan. It has lately developed a new method of making this paper, some of the processes of which must be done in low temperature. The Vilter Company has also received an order for the equipment of a fish freezing plant for the Chloepck Fish Company, Seattle, Wash. The equipment includes a 70-ton refrigerating plant, together with all accessories.

The Turner Brass Works, Chicago, has completed its new factory at Sycamore, Ill., and is now occupying it. The main factory building has a floor space of 40,000 sq. ft., with power and heating plants additional, in which improved machinery has been installed and the facilities enlarged and greatly improved. The company is located on the main line of the Chicago & Great Western and Chicago & Northwestern railroads, with side tracks to the factory. As soon as completely settled all orders will be shipped promptly. All correspondence and orders should be sent to the main office, Sycamore, Ill.

Cleveland Machinery Market.

CLEVELAND, OHIO, August 6, 1907.

The machine tool market has been very quiet during the past week, the aggregate sales being much below those of the few preceding weeks. The lull, however, was not unexpected by local dealers, who have been well satisfied with the way business has kept up during the summer months. There are still quite a number of inquiries in the market, but many of the concerns making the inquiries are, for some reason, slow about making purchases. Although deliveries are somewhat better, complaint is frequently heard from purchasers who are disappointed because they are not getting tools, ordered several months ago, nearly as soon as they were promised. The present demand is mostly for medium sized tools to replace old tools that have become worn out. The demand for new machine tool equipment to replace old is expected to improve if deliveries continue to improve. There are more second-hand tools on the market than there were a few weeks ago, but dealers have little trouble in disposing of these tools about as fast as they are placed in stock. Manufacturing plants engaged largely in the manufacture of automobile parts report that the automobile builders have placed orders for these parts earlier and in larger quantities than usual this season, and these plants are now well filled with orders for automobile parts for 1908 machines. Foundries are not rushed as they were in the spring, and for that reason can make much better deliveries. The demand for castings continues good, however, and foundrymen report that they have plenty of work on hand.

The new plant of the Standard Welding Company is well under way, and the company expects to be located in its new quarters about November 1. The steel work for the main building is now being erected, and the contract has just been let for the annealing and inspecting buildings, and specifications have been prepared for the superstructure of the engine and boiler building. Contracts have been let for boilers, engines, smokestacks, heaters and pumps, and plans are being prepared for the steam fitting and heating systems. The company has placed contracts for two Buckeye engines, one 1500 hp. and one 250 hp., and for two Babcock & Wilcox boilers, each of 250 hp. Other boilers will be moved from the old plant. The company will soon be in the market for a quantity of hangers, shafting and counter-shafting and other equipment. Considerable special machinery will be required, a large part of which the company will manufacture itself.

The Sheer Bros. Iron & Fence Company has commenced the erection of a new plant adjoining its present location on

East 103rd street. The building will be 32 x 50 ft., two stories, with a basement which will be used for a wood-working department. The company is in the market for a second-hand heavy punch and shear and woodworking machinery, and will probably also buy a gas engine. The demand for its goods far exceeds the capacity of its plant, and further extensions will probably be made before long.

The Warren Steel Range Works, Warren, Ohio, which has been a part of the Warren Hardware Company, has been incorporated as a separate organization under the name of the Warren Stove Company, with a capital stock of \$75,000. The incorporators are M. Jameson, L. M. Jameson, W. J. Masters, William Wallace and H. Q. Stiles, of Warren, and H. C. Christy, H. C. Bradley and Isaac Kirk, of Cleveland. New machinery is being added, and the output of the plant will be increased.

The Strand Heater Company, Cleveland, has been incorporated with a capital stock of \$10,000 by Henry Strand, John Freund, J. G. Reyant, L. D. Greenfield and A. M. Freund. The company intends to establish a factory for the manufacture of a gas heater.

Work is being pushed on the new plant of the Seneca Chain Company, Mansfield, Ohio. The machine shop is ready for the roof, and the two forge shops are well under way. The company expects that the new plant will be ready for operation about September 1.

The Wagener Steam Pump Company will move its plant from Louisville to Canton, Ohio, and has commenced the erection of a factory in the latter city, which will be ready for operation about October 1. The company has acquired a site along the Baltimore & Ohio Railroad, near Wade street.

The Buckeye Steel Castings Company, Columbus, Ohio, has purchased an acre of land adjoining its plant, on which it will erect a handsome office building.

The Buckeye Pump & Mfg. Company, Columbus, Ohio, has secured a new site at Center and Broad streets, and will at once begin the erection of a new plant. Because of the growth of its business the company found its present quarters inadequate.

The Fulton Pit Car Company, Canal Fulton, Ohio, maker of industrial cars, &c., is looking for a more desirable location on which to erect a larger plant, that is needed because of the growth of its business.

Sealed proposals will be received by the Board of Trustees of Public Affairs, Ashland, Ohio, until August 26, for one high duty horizontal cross compound condensing crank and flywheel steam pumping engine of a capacity of 1,500,000 gal. per day of 24 hr., with boilers, engines, feed pump and all apparatus necessary to operate the pumps and boilers. The equipment will be used for the enlargement of the Ashland water works.

The council of Zanesville, Ohio, has authorized the Board of Public Service of that city to advertise for bids for a new pump and boiler for the water works pumping station in that city. An appropriation of \$12,000 has been made for the pump and \$2000 for the boiler.

Cincinnati Machinery Market.

CINCINNATI, OHIO, August 6, 1907.

The past week has shown a slight increase in new business, and while it may have been merely a temporary rally it is nevertheless commented upon very favorably by builders of machine tools. Manufacturers are showing little disposition to worry over the fact that the influx of new business is less than it was some months since, as it is well known that they have sufficient orders already on their books to carry them far into the next year. Considerable annoyance and speculation would, therefore, be allayed were it positively known that present conditions were simply of a temporary nature, and that activities would be resumed within the next month or two. In the absence of this positive knowledge, however, and the general optimistic feeling prevailing throughout the country, a number of concerns are taking steps toward the expansion of their plants, which would practically indicate that they have faith in future developments, and expect normal conditions to return soon. For quite a time it has been the custom for representatives of large concerns desiring to purchase equipments of machine tools to visit personally the plants and secure a full line of the various machines desired. Of late this has not been of such frequent occurrence, and there appears to be more of a disposition on the part of prospective purchasers to place orders through the medium of the larger sales agencies. This has to a certain extent made it impracticable for manufacturers at all times to keep fully advised as to the ultimate destination of the machines shipped on consignment, which is somewhat unsatisfactory. Little consideration is now being given to the development of new designs and other advances in the way of labor saving devices, as the time of the shops is virtually taken up with

the numerous duties necessary to secure the requisite output within contract time.

The L. Schreiber & Sons Company, which recently removed to its new and very much enlarged plant at Norwood, secured the contract for the bronze entrance doors for the Maryland Institute Building, at Baltimore, Md. By invitation of the company, quite a number of those interested visited the plant to see the doors upon their completion. It is said that they are the heaviest and largest ever turned out by a manufacturing concern west of the Allegheny Mountains, and when in place will have cost approximately \$10,000. Each door weighs 2200 lb., and they are so arranged that but little pressure is required to swing them. They are of solid bronze, 4½ in. thick, and are designed along classic lines with a leaning toward the French Renaissance school. The width of the opening is 10 ft., and the doors are 15 ft. high.

The second annual outing of the Cincinnati branch of the National Metal Trades Association was held at Chester Park last Saturday.

The Lunkenheimer Company, Cincinnati, claimed to be the largest manufacturer of high grade engineering specialties in the world, gave its forty-fifth annual picnic at Whitewater Park, July 27. The park is about 25 miles from the city, and three special trains were necessary to carry the employees and their families to the park. The company furnished, free, all refreshments, transportation, &c., and also a number of prizes that were awarded to the winners in the several contests.

The Columbus Brass Company, Columbus, Ohio, gave an outing to its employees and families last Saturday.

The Hyatt-Wise Mfg. Company, Columbus, Ohio, has been incorporated with a capital of \$25,000, by Samuel W. Hyatt, Oscar Wise, and others. It will manufacture gas burners, dies, tools and sheet metal specialties.

Harry H. Moeser, who for the past 19 years has represented one of the leading shops in Cincinnati in selling machinery supplies, has taken up agency lines for Trusane & Williams, Alliance, Ohio, drop forgings, and the Mummert, Wolf & Dixon Company, Hanover, Pa., oil grinding and sharpening machines. He is located at 909 Rogers place, Cincinnati.

Philadelphia Machinery Market.

PHILADELPHIA, PA., August 6, 1907.

Some little improvement is noted in the local machinery market. While the volume of business transacted has not been large, orders were placed with a little more frequency than for several weeks, and when the season of the year, as well as conditions in general, are taken into consideration, it may be said that the market was a shade stronger. Nearly all of the business placed on the books recently has been confined to single tool propositions. Here and there an order for a small lot of tools for minor shop equipment has been booked, but the number has not been large. Lathes, mostly of the smaller and medium sizes, have probably had the larger sale. Drill presses also came in for a good share of the business, while orders for a few shapers, milling machines, planers of the smaller sizes and miscellaneous tools, made up the bulk of the business done.

Inquiries have been a little more active, but are confined to propositions of the smaller class, no specifications for any extensive machine tool equipment being before the trade at the time. Some little railroad business is drifting in, but is almost completely confined to inquiries for single tools for the different railroad shops, the tools in the larger number of cases being required for replacement. What little business is offered is subject to keen competition, as all the merchants as well as some of the manufacturers are anxious to put new business on their books. Manufacturers, as a rule, are booked considerably ahead. Builders of special machinery and tools continue actively engaged, although orders are probably not as good as they were some few weeks ago. Deliveries, on the whole, have improved materially, and stocks on dealers' floors are better by far than they have been for many months.

There is not much change to be noted in the foreign demand. This branch of the trade has been particularly quiet recently in this territory. Manufacturers of the usual standard types of machine tools do not appear to go after this trade very aggressively, although builders of special tools have taken quite a fair amount of business. Those transacting an established trade abroad on machinery specialties and power transmission equipment report a moderately good amount of business.

Some fairly good business in boilers and engines has been closed, but mainly in the medium and smaller capacities. Some large propositions are under consideration, but these do not close up very promptly during the vacation season. Second-hand boilers and engines have been the subject of a fair amount of inquiry, although but a moderate amount of actual business has been transacted recently.

Second-hand machinery and tools, following the general condition of the market, have not been active. Sales are usually tools of the smaller sizes, although there has been some inquiry for some tools of the larger sizes, which, however, have been rather difficult to get. Pumps have been in more active demand, and some good sales have been made.

The foundry trades continue actively engaged. There is a good demand for both iron and steel castings, and the larger proportion of the foundries are running pretty full on orders in hand, although some would like to book business for delivery later in the year. Machinery castings, it is said, can be had more promptly than was the case some time ago, although steel castings are as hard as ever to get for prompt shipment.

The Department of Public Works, Bureau of Filtration, George C. Stearns, director, will receive bids until August 22 for the improvement, extension and filtration of the water supply, in connection with the Torresdale and Roxborough filtration plants. Proposals are being asked for preliminary filters at Torresdale under contract No. 102, and for extensions to the piping system at the Roxborough plant under contract No. 108.

The Gray Iron Castings Company, Reading, Pa., has about completed the erection of a three-story concrete addition, 40 x 48 ft., which will be used as an extension of its machine shop, and is now in the market for a number of tools for the equipment of the same. Among the tools desired are lathes of the smaller sizes, drill presses, a milling machine and a quantity of bench tools.

L. F. Seyfert's Sons, dealers in new and second-hand machinery, tools and equipment, report a fair volume of business, considering the season. They are in the market for a good strong second-hand engine lathe, 38-in. swing, with either an 18 or 20 ft. bed.

Ballinger & Perrot, architects and engineers, have awarded the contract for the erection of the new concrete machine shop for the Earle Gear & Machine Company, at Stenton and Loudon streets, to the Concrete Engineering & Supply Company. It is expected that the building, which will be 70 x 138 ft., two stories, will be ready for occupancy by November 1. Little new machinery will be required by the Earle Company; that being used in its present plant will be transferred to the new one on its completion. An order for a 10-ton electric traveling crane, 23-ft. span, to run through the new shop, has been given by the company to Maris Brothers of this city.

The Wetherill Finished Castings Company has started work on its new foundry and machine shop at Erie avenue and Richmond street. This company is now receiving bids for equipment of the machine shop, which will include several lathes, planers, drills and small tools, and it is understood that contracts for these will be let at an early date. The new plant is expected to be completed by December 1.

The High Duty Saw & Tool Company, Eddystone, Pa., reports a good volume of new business. Foreign trade is improving materially, and a No. 3 Paragon cold sawing machine and five 38-in. standard Tindel saw blades, were recently shipped for European delivery. An order has also been received from the Niles-Bement-Pond Company for a No. 2 saw grinding machine and six 36-in. Standard Tindel saws, for shipment to the Kawasaki Dock Yards, Japan. A No. 2 Paragon sawing machine has just been installed at the works of the Conley Frog & Switch Company, Memphis, Tenn., while a No. 1 Paragon machine was delivered to the John Oberberger Company, Milwaukee, Wis. Sales of inserted tooth saw blades are reported very satisfactory, and every department of the plant is actively engaged.

Plans for the abolition of the grade crossings of the Reading Railway Company from south of Berks street to north of Broad street were recently approved, we understand, by the Bureau of Surveys for the City of Philadelphia. The Pennsylvania Railroad has also submitted plans for the abolition of its grade crossings on the line of its Philadelphia & Trenton branch. Plans and specifications for the Reading Railway work include steel structures at Eleventh and Nevada streets, Twelfth and York streets, Thirteenth and Cumberland streets, Susquehanna avenue and Colono and Dauphin streets, while concrete arches will be built at Norris and at Berks street. The plans of the Pennsylvania Railroad include the abolition of 31 grade crossings on its line. Bids for the work in connection with the above are expected to be advertised for at an early date.

The announcement is made that *Compressed Air*, heretofore published by the Kobbé Company, 108 Fulton street, New York, will hereafter be published by the Compressed Air Magazine Company, Bowling Green Building. W. L. Saunders remains editor of the magazine, but W. R. Hulbert, the managing editor, has resigned and has been succeeded by Frank Richards. Mr. Richards, who is the author of the book, "Compressed Air," was for 10 years one of the editors of the *American Machinist*.

Government Purchases.

WASHINGTON, D. C., August 6, 1907.

The Isthmian Canal Commission will soon ask bids for 12 four-wheel saddle tank locomotives, engine and generators of about 5 kw. capacity, one 24 in. by 14 ft. screw cutting engine lathe, one double punchnig and shearing machine, one power plate splitting shear, one 72-in. belt driven boring and turning mill, and three 21-in. wheel and lever plain drilling machines.

The Isthmian Canal Commission will receive bids until August 14 for duplex pumps, boilers, mechanical shakers, &c.

The following bids were opened July 30 for supplies for the navy yards:

Bidder 2, Atlas Engine Works, Indianapolis, Ind.; 10, Babcock & Wilcox Company, New York; 12, F. S. Banks & Co., New York; 26, Bigelow Company, New York; 41, W. W. Clark & Son, Baltimore, Md.; 49, P. Delaney Company, Newburgh, N. Y.; 57, De Zouche Henson Company, Philadelphia, Pa.; 72, Fox Bros. & Co., New York; 79, A. P. Granger Company, New York; 89, Harron, Rickard & McCone, San Francisco, Cal.; 117, Knox & Bro., New York; 138, Manning, Maxwell & Moore, New York; 147, National Supply Company, Chicago, Ill., informal, no guarantee; 148, Northern Electric Mfg. Company, Madison, Wis.; 166, John B. Roache, Brooklyn, N. Y.; 172, R. H. Richardson & Son, Hampton, Va.; 175, Charles E. Robidoux, St. Louis, Mo.; 215, R. M. Wilkinson, Norfolk, Va.; 226, Donogan & Swift, New York; 227, Excelsior Equipment Company, Pittsburgh, Pa.

Class 1. Installing two 100-hp. stationery water tube boilers and accessories—Bidder 2, \$11,810; 10, \$11,570; 79, \$9589; 89, \$1834, part.

Class 83. Five hydraulic jacks and six screw jacks—Bidder 41, \$377.64; 72, \$336.43; 117, \$354.46; 138, \$352.20; 166, \$257.08.

Class 111. One motor drive outfit for vertical drill and one for slotting machine—Bidder 148, \$1330.

Class 112. One motor drive outfit for shearing machine and one for punching machine—Bidder 148, \$1250.

Class 113. One motor drive outfit for horizontal punch, one for convertible punch and shear and one for double angle iron shear—Bidder 148, \$1900.

Class 114. Six fuel oil blacksmith forges—Bidder 57, \$1875; 147, \$3620; 178, \$520; 215, \$1530.

Class 115. One vertical tubular submerged head boiler—Bidder 26, \$670; 49, \$620; 72, \$694.50; 79, \$557 and \$488; 175, \$495; 226, \$735; 227, \$535.

Class 116. One duplex boiler feed pump—Bidder 12, \$40; 226, \$65; 227, \$43.75 and \$47.50.

Class 117. One steam pump brake windlass—Bidder 6, \$725; 90, \$600.

The following awards have been made for supplies for the navy yards, bids for which were opened July 23:

Lucas Machine Tool Company, Cleveland, Ohio, class 31, one horizontal boring, drilling and milling machine, \$3980.

Camden Iron Works, Camden, N. J., class 32, one improved hydraulic accumulator, \$2580.

H. B. Roelker, New York, class 34, two dense air ice machines, \$9100.

Niles-Bement-Pond Company, New York, class 35, one 2500-lb. single frame steam hammer, \$2250.

Hawley Down Draft Furnace Company, Chicago, Ill., class 37, one melting furnace, \$800.

Class 36, one positive pressure blower, has been canceled.

Under bids opened July 16 for supplies for the navy yards the Niles-Bement-Pond Company, New York, has been awarded class 61, one motor drive outfit, \$800.

The Susquehanna Iron Company.

Michael Blake, who has operated the properties of the old Susquehanna Iron & Steel Company during the months of June and July, turned over everything, including the bills receivable and accounts payable, to the new corporation, the Susquehanna Iron Company, on August 1. This company was granted a charter under the laws of Pennsylvania on July 29 and began its corporate existence August 1. At the first meeting of the company on Thursday last the following were elected directors: Michael Blake, New York; Charles Brock, Boonton, N. J.; W. W. Griest, Lancaster, Pa.; Philip B. Shaw, Williamsport, Pa., and W. W. Hepburn, Philadelphia. They then elected officers as follows: Charles Brock, president; Michael Blake, treasurer, and Martin N. Clepper, secretary. The company has been incorporated for \$1,000,000, and the entire stock is owned by Messrs. Blake, Brock, Shaw and Griest, each holding an equal share.

Weston Jenkins, Jr., has been appointed superintendent.

ent of the rolling mills and skelp mills. He is a young man, but for several years has been assistant superintendent of the Boonton Iron & Steel Company, Boonton, N. J. Being a very bright mechanic he has already made several improvements in the bar and skelp mills at Columbia and York. Robert A. Slater assumed control of the new pipe mill August 5. He is an able pipe manufacturer, having had charge of the manufacture of pipe for over 20 years. He was for a long time assistant superintendent of the American Tube & Iron Company's works at Middletown, Pa., now owned by the National Tube Company, and for the past three years has been assistant superintendent of the Coatesville Tube Works of the Worth Brothers Company. With practical men in charge of the manufacturing end of the company's business and with men of abundant means as officers and directors the new company starts on its business career under exceedingly promising auspices. The principal offices of the company are at Columbia, Pa.

The Spanish-American Iron Company.

Henry & West, Philadelphia, are offering at 98½ and interest \$1,000,000 first mortgage sinking fund 6 per cent. 20-year gold bonds, guaranteed for principal, interest and sinking fund by indorsement by the Pennsylvania Steel Company of New Jersey, a large majority of whose capital stock is controlled by the Pennsylvania Railroad Company. These bonds are dated July 1, 1907, and are due July 1, 1927, but the whole issue or any part is callable on proper notice at 102½ and interest, while for sinking fund purposes only the bonds are callable at par and interest. The authorized issue is \$5,000,000.

E. C. Felton, president of the Pennsylvania Steel Company, has issued a letter explanatory of the enterprise, from which the following extracts are taken:

These bonds are the obligation of the Spanish-American Iron Company, a corporation of West Virginia, whose capital stock (\$2,400,000) is all owned by the Pennsylvania Steel Company of New Jersey. They are part of an issue of \$5,000,000 authorized, secured by a first mortgage upon 27,870 acres of ore lands owned in fee and as mining rights (free from the payment of any royalty) by the Spanish-American Iron Company, and estimated to contain 600,000,000 tons of iron ore. They will also be secured by a first mortgage upon about 20 miles of railroad and inclined planes, terminals, docks, buildings, rolling stock, franchises, rights, &c., now owned or hereafter to be acquired in connection with these properties.

The properties are located at Mayari, near Nipe Bay in the Province of Oriente on the north shore of Cuba, where what is probably the best deep water harbor in Cuba exists. The Spanish-American Iron Company is now constructing a standard gauge railroad, with steel or concrete bridges and culverts, and a maximum grade of ½ of 1 per cent., which will connect the harbor terminals with the inclined planes, down which the ore is lowered by gravity from the top of the mountain where the mines are located. Electrically operated drying and storage plants and loading and discharging docks will be provided. The ore is a surface deposit which can be taken out with steam shovels just as clay is dug out of an ordinary clay bank. The lands are largely covered by pine timber, which will command a ready market in Cuba. The Mayari ore when freed from the water shows a high percentage of iron, is very low in phosphorus and is otherwise a most desirable material for the manufacture of all high grade steel.

A sinking fund of 30 cents per ton has been provided on all ore shipped from the old mines of the Spanish-American Iron Company in Cuba, which are now producing and will for many years to come produce about 450,000 tons per year, as well as from the Mayari properties about to be developed. During the first three years this sinking fund will retire each year at least \$120,000 bonds at 100 and interest, unless they can be purchased for less in the open market; during the next 16 years at least \$275,000; in the twentieth year at least \$240,000; so that the entire contemplated issue will be extinguished at or prior to maturity.

The bonds are further secured by the contract of the Pennsylvania Steel Company of Pennsylvania and Maryland Steel Company of Maryland (the subsidiary manufacturing companies of the Pennsylvania Steel Company of New Jersey) to take and pay for a minimum of 1,000,000 tons of ore annually at a price which will net a profit of at least 60 cents per ton to the Spanish-American Iron Company, or \$600,000, while the maximum payments on account of interest and sinking fund can in no case exceed \$575,000 per annum. The Pennsylvania Steel Company of New Jersey furthermore guarantees the punctual payment of the principal, interest and sinking fund of these bonds by indorsement upon each bond.

It is understood that physically the ore is very fine, contains a large amount of water and must be dried and cindered before it can be used in the blast furnace. The

management of the Pennsylvania Steel Company has been experimenting with it for the past three years and has developed methods of treatment which have proved highly satisfactory.

June Exports and Imports of Iron and Steel.

The June report of the Bureau of Statistics of the Department of Commerce and Labor completes the foreign trade statistics for the fiscal year 1906-1907. The total value of the exports of iron and steel and manufactures thereof, not including ore, for the 12 months ended June 30, 1907, is shown to have been \$181,530,871, against \$160,984,985 in the previous fiscal year. The exports for the past year are much the largest thus far recorded in the history of the country. The total value of similar imports for the last fiscal year was \$40,587,865, against \$29,053,987 in the fiscal year 1906. Taking commodities for which quantities are given, the report shows that in the fiscal year just ended these exports aggregated 1,229,227 gross tons, against 1,331,323 tons in the previous year. These figures show that the great gain in our exports was made in the more highly finished forms of manufacture. The imports of similar commodities in the last fiscal year were 755,409 gross tons, against 491,942 tons in the previous fiscal year. The heavy gain in these imports was due to the great increase in the imports of pig iron.

In the month of June the value of the exports of iron and steel and manufactures thereof, not including ore, was \$17,226,259, against \$14,593,643 in May. Taking the commodities for which quantities are given, the exports in June were 92,529 gross tons, against 91,513 tons in May, 132,332 tons in April and 112,758 tons in March. The following table gives the exports of these commodities for June and for the fiscal year ending with June in 1907 and 1906:

Exports of Iron and Steel.

	June,		Twelve months.	
	1907.	1906.	1907.	1906.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	5,957	6,641	85,000	59,509
Scrap	1,945	917	22,152	10,241
Bar iron.....	1,505	4,065	41,484	42,719
Wire rods.....	677	296	10,250	6,482
Steel bars.....	7,768	2,616	52,300	22,606
Billets, blooms, &c....	3,750	17,281	113,866	273,272
Hoop, band, &c.....	419	323	5,886	5,042
Steel rails.....	18,358	25,996	291,322	345,826
Iron sheets and plates.	2,462	1,369	29,620	10,233
Steel sheets and plates.	7,517	6,590	98,178	78,591
Tin and terne plates.	661	1,173	8,881	11,592
Structural iron and steel	11,495	11,719	125,132	97,668
Wire	11,727	15,515	161,241	164,253
Cut nails.....	664	724	7,871	6,887
Wire nails.....	3,601	3,392	39,953	44,572
All other nails, including tacks.....	1,582	292	7,512	4,333
Pipes and fittings....	12,441	8,709	128,579	147,497
Totals.....	92,529	107,618	1,229,227	1,331,323

The total value of imports of iron and steel and manufactures thereof, not including ore, in June was \$3,272,259, against \$4,520,103 in May. The following table shows the imports of commodities for which quantities are given for June and for the fiscal year ending with June in 1907 and 1906:

Imports of Iron and Steel.

	June,		Twelve months.	
	1907.	1906.	1907.	1906.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	44,885	22,906	564,846	271,790
Scrap	3,624	490	21,349	25,810
Bar iron.....	4,322	4,351	38,600	37,917
Rolls	663	389	4,610	9,635
Hoop, band, &c.....	5	260	4,369	11,197
Billets, bars and steel in forms n.e.s.....	903	2,275	18,520	19,643
Sheets and plates....	241	679	3,429	3,297
Tin and terne plates.	3,880	4,458	63,629	53,937
Wire rods.....	1,603	2,146	17,907	18,495
Wire and articles made from	560	544	8,780	4,623
Structural iron and steel	274	2,464	9,370	35,598
Totals.....	60,960	40,962	755,409	491,942

The quantity of iron ore imported in the 12 months ending with June was 1,096,717 gross tons, against 981,-

026 tons in the corresponding period of the previous year. The exports of iron ore in the same periods were, respectively, 238,125 and 227,378 tons.

The Michigan Copper & Brass Company's Opening.

The Michigan Copper & Brass Company, Detroit, Mich., has completed its plant. The starting of the machinery last week was attended with considerable ceremony. The stockholders and their friends gathered in force and were addressed by George H. Barbour, president of the company, whose remarks embodied considerable information about the new enterprise, as follows:

"In soliciting capital I found a sufficient number of gentlemen willing to subscribe the \$400,000 common stock called for, which at that time was considered sufficient to build this plant and equip it. But, as is oftentimes the case with investments of this kind, as the work progressed we found this sum inadequate and we issued \$200,000 preferred 6 per cent. interest bearing stock, of which \$150,000 has been placed, leaving a balance of \$50,000 still in the treasury. We, therefore, have represented here an investment of \$550,000 in cash. Contracts for the buildings, including the mason, steel and woodwork, were let April 3, 1906. Ground was broken April 13, 1906. Contracts for boiler and engine were let March 17, 1906, and then followed the contracts for machinery and equipment, such as are here exhibited to-day.

"John Scott & Co. of Detroit, were the architects. Hugh L. Thompson of Waterbury, Conn., was the engineer, and Mr. Hoyt of Waterbury, Conn., has had charge of the foundations, erection of machinery, &c. Jeremiah Howe, our superintendent, has been constantly on the work, and has given his closest personal attention to all details.

"It is very gratifying to me, and I believe to all the stockholders and directors, to know that this plant and its equipment have been completed and paid for in cash, and that what you see to-day is without a dollar of indebtedness upon it. I believe we have the most modern and up to date copper rolling mill in the country. We are prepared to turn out the very best grades of the product we propose making. Our machinery, engine, rolls and, in fact the entire equipment, are the latest, most improved and best that money can buy. We believe this institution will prove one of great interest to the general manufacturing industries of Detroit.

"We are living in what might be termed an age of copper, with a constantly increasing demand for copper and brass products. Even with the high prices ruling for sheet copper the past year or more it has been used very extensively for roofs of buildings, cornice work, &c., and with the immense quantity of copper wire used by such concerns as the Westinghouse and the General Electric companies and by the electric roads all over the country it will, in my opinion, take a large increase in production to supply the demand for future requirements.

"Why should we not manufacture the product of our own State? Here we are located some 700 or 800 miles nearer the points where copper is produced than many of our competitors, and is it not better in almost every way to manufacture it right here at home than to have it shipped East, manufactured there and returned to the West? We are most favorably located for this particular branch of industry."

The officers of the company are as follows: George H. Barbour, president; James E. Danaher, first vice-president and treasurer; D. M. Ireland, second vice-president; James T. Whitehead, secretary; Jeremiah Howe, superintendent. The directors are George H. Barbour, James E. Danaher, D. M. Ireland, James T. Whitehead, Henry B. Ledyard, Jeremiah Dwyer, F. T. Moran, Fred M. Alger and E. J. Corbett.

The Sharon Steel Hoop Company, Sharon, Pa., has signed the Amalgamated scale subject to any changes that may be made by the Conciliation Board. This company has a special scale for its hoop mill.

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HARDWARE

OLD Home Week, as originally celebrated in some old New England towns, served an excellent social purpose in bringing together in reunion men and women whose careers have led them away from the scenes of their youth. In the life of the small country town it had come to be an annual occasion of mutual pleasure and in a small way of pecuniary benefit. But the custom has wandered from its original purpose, and, shorn of its real function, has been taken up by cities, even those of large population, until it has become a factor in New England, and, according to the generally expressed opinion of those who have had the experience, not a beneficent factor, either from the standpoint of the merchant or the manufacturer. The experiment has been tried in a number of cities of more than 100,000 inhabitants, and it is not believed to be a paying institution. The essential idea of an Old Home Week is lost in a general celebration, which is more like that of a protracted Fourth of July than a reunion of old friends and neighbors. Consequently the week must be considered as a carnival pure and simple.

Experience has shown that the stores of most merchants suffer actual loss of trade, though the occasion might seem to promise an active demand in many lines of retail business, as the people, drawn from a wide area of country, might be supposed to take the opportunity to do considerable buying. But, on the contrary, the country folk and those from contiguous towns and villages are most deeply interested in the entertainments and pageants lavishly provided for them. The several days are crowded with attractions. The summer resorts of the city are liberally patronized. The very allurements which bring the visitors serve to keep them from the stores, and at the same time the people of the city itself are too busy for their shopping. Trade lost to a merchant during a given period of time, whether by unseasonable weather, or flood, or blizzard, or by the effect of lavishly furnished opportunity for pleasure and excitement, is never wholly made up by later buying.

An even greater loss to a city is through the check to its industries. Employees cannot be made to work while there is so much of excitement going on around them. Shops and factories and mills are so shorthanded that they cannot be operated to advantage. There must be material loss where disorganization exists for several days. With manufacturers as busy as they now are it is a serious matter to lose valuable time, which should be occupied in rushing production, that the wants of customers may be supplied. In a recent instance a city of 130,000 people, largely dependent upon its manufacturing industries, had four days of Old Home Week, and the estimate of the manufacturers makes their losses aggregate a very large amount. One concern manufacturing Hardware was able to get together less than 100 of its 400 workmen on one of the days, and throughout the week the number of absentees was so large as seriously to interfere with production. The loss of money to the city in the matter of payroll alone constitutes quite an item, which the local merchants will feel.

It is well to bring together old friends in a country town, which has sent out much of the best of its youth year after year, while it fell into a period of comparative decadence. Thousands of people journey to scenes of their childhood each summer because of Old Home Week. To these old towns the occasion is profitable.

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Condition of Trade.

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NOTES ON PRICES.

Wire Nails.—Mills of the largest interest had not accumulated stocks for fall trade up to August 1, and prospects are that no large quantity of Nails can be piled up during the present month, owing to the continued demand. Indications point to a recurrence of the trouble experienced by merchants during the past spring, of being unable to get Nails promptly enough to supply their needs. The placing of orders early and keeping future requirements well covered is a safe policy to pursue. It is not considered probable that any reduction in prices will be made. Quotations are as follows, f.o.b. Pitts-

burgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$2.00
Carload lots, to retail merchants.....	2.05

New York.—In this market the demand is exceptionally good for the season. The local market is generally maintained, except that sometimes Hardware jobbers sell Nails at less than regular quotations to influence the sale of other goods. New York jobbers' quotations are: To retailers, carloads, on dock, \$2.19; less than carloads, on dock, \$2.33; small lots at store, \$2.30.

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Barb Wire.—The mills are gradually catching up on their shipments. Buyers are sending in specifications on contracts freely, but new business is light. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.15	\$2.45
Retailers, carload lots.....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

Chicago.—Slightly better deliveries are now obtainable. Conditions are otherwise unchanged. We quote as follows: Jobbers, Chicago, car lots, Painted, \$2.33;

Galvanized, \$2.63; to retailers, car lots, Painted, \$2.38; Galvanized, \$2.68; retailers, less than car lots, Painted, \$2.50; Galvanized, \$2.80; Staples, Bright, in car lots, \$2.30; Galvanized, \$2.60; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—New demand is light, but the mills are making heavy shipments on contracts placed some time ago, and on which buyers are specifying freely. The mills are catching up to some extent on back orders, but are still somewhat behind. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.15	\$2.45
Retailers, carload lots.....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

Smooth Fence Wire.—Large contracts for fall delivery are being placed by manufacturers of Fencing and Wire Goods. Specifications on contract orders, which were placed some time since, are being received in large volume. The market is firm. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....	\$1.85
Retailers, carloads.....	1.90

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....Base.	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized....	\$0.30	.35	.40	.45	.55	.65	1.05	1.15	

Chicago.—Fence makers and Wire fabricators are not only pressing for shipments on contract, but are coming into the market for new requirements. Indications point to a large fall trade. Quotations are as follows: In car lots, to jobbers, \$2.03, f.o.b. Chicago, and to retailers, \$2.10.

Pittsburgh.—Fence manufacturers are now placing heavy contracts for Fence Wire for fall delivery, while shipments against specifications on contracts placed with the mills some time ago are heavy. We are advised that prices are being strictly held. Quotations are as follows, f.o.b. Pittsburgh 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....	\$1.85
Retailers, carloads.....	1.90

The foregoing prices are for base numbers, 6 to 9.

Agricultural Tool Handles.—Revised quotations have been sent to the trade by leading manufacturers of Ash Handles for Agricultural Tools. Not only are there changes in discount representing advances of from 5 to 10 per cent., but the freight allowance to which buyers have been accustomed has been withdrawn, making the prices quoted f.o.b. factory. The producers state that the advances were necessitated by the increased cost of lumber, which is getting very scarce in desirable grades. It may be expected that the changes will be reflected promptly in quotations to retailers for whom the new level of the market may be represented in a general way by a discount of 40 per cent.

Wire Picture Cord.—The market for Wire Picture Cord is apparently pretty well demoralized, few manufacturers attempting to maintain scheduled prices. Some show a disposition to take orders on the best terms that can be secured and then make the goods to price. Light and short length Cord seems to be entirely acceptable to many jobbers, department stores, &c., who purchase it wittingly and readily resell it without question from their trade. More scrupulous merchants are probably paying somewhat higher prices than are obtainable on this class of goods.

Conductor Pipe.—Under date of August 3 a new schedule of discounts recommended on Conductor Pipe, Eaves Trough, &c., has been sent to the jobbing trade representing an important readjustment of prices. Noteworthy changes have been made in territorial divisions, principal among which is the inclusion of the States of Ohio, Indiana, Illinois, Michigan and Kentucky in the central territory, a section in which prices have been considerably reduced, presumably as a result of competition. Quotations for

Western, Southern and Southwestern territory are also somewhat lower than have been scheduled in the past. A moderate decline for all territories will be noted in Copper Pipe and Trough, reflecting recent reductions in the price of Sheet Copper. The schedule follows:

	Eastern territory.	Central territory.	Western and Southern territory.	Southwestern territory.
Conductor Pipe:				
Galvanized Steel, standard sizes and gauges.....	70%	70-5%	70%	65-5%
Galvanized Steel, irregular sizes and gauges.....	70-10-5%	75%	70-10%	70%
Galvanized C. C. Iron, standard sizes and gauges.....	50-17½%	60%	55-5%	50-5%
Galvanized C. C. Iron, irregular sizes and gauges.....	70-10-5%	75%	70-10%	70%
Copper, 14 to 20 oz.....	30-10%	30-10%	30-7½%	30-5%
Eaves Trough:				
Galvanized Steel, standard sizes and gauges.....	70-30%	80%	70-30%	75-7½%
Galvanized Steel, irregular sizes and gauges.....	75%	75%	70-10%	70%
Galvanized C. C. Iron, standard sizes and gauges.....	70%	70-5%	70%	65-5%
Galvanized C. C. Iron, irregular sizes and gauges.....	75%	75%	70-10%	70%
Copper, 14 to 20 oz.....	30-10%	30-10%	30-7½%	30-5%
Ogee Box and Roof Gutter:				
Galvanized Steel, standard sizes and gauges.....	80%	80%	70-30%	75-7½%
Galvanized Steel, C. C. sizes and gauges.....	70%	70%	65-10%	65-5%
Misers, End Pieces and Drops:				
Galvanized Steel.....	35%	35%	35%	35%
Galvanized Charcoal Iron.....	List net.	List net.	List net.	List net.
Plain Ridge Roll and V. Ridge Cap:				
Galvanized Steel.....	80%	80%	70-30%	75-7½%
Galvanized C. C. Iron.....	70%	70%	65-10%	65%
Formed Valley:				
Galvanized Steel.....	70%	70%	65-10%	65%
Galvanized C. C. Iron.....	50-10%	50-10%	50-5%	40-10%

TERRITORIAL LIMITS.

Undefined Territory.—Territories not defined below will take the prices for Central Territory with freight allowed to any one of the following points through or nearest which shipment must pass to reach destination: Joplin, Mo.; Nevada, Mo.; Kansas City, Mo.; St. Joseph, Mo.; Omaha, Neb.; Sioux City, Iowa; St. Paul, Minn.; Minneapolis, Minn.

Eastern Territory.—The Eastern Territory consists of the New England States, the States of New York, New Jersey, Delaware, Maryland, Virginia and West Virginia.

Central Territory.—The Central Territory consists of the States of Ohio, Indiana, Illinois, Michigan, Wisconsin, Iowa, Minnesota, Kentucky, Tennessee, and that part of the State of Minnesota lying south and east of the Minneapolis, St. Paul & Omaha Railroad from a point on the Iowa State line near Worthington to Minneapolis and St. Paul and south and east of the St. Paul & Duluth Railroad from Minneapolis to Duluth, also the city of Sioux Falls, S. D.

Southern Territory.—The Southern Territory consists of the States of Mississippi, Alabama, Georgia, Florida, North Carolina and South Carolina, and including the cities of New Orleans, La.; Galveston, Texas, and Houston, Texas.

Western Territory.—The Western Territory consists of the States of Kansas and Nebraska.

Southwestern Territory.—The Southwestern Territory consists of the States of Oklahoma, Louisiana, Arkansas and Texas, except the cities of New Orleans, La.; Galveston, Texas, and Houston, Texas.

Steel Goods.—Buyers are awaiting with special interest the announcement by the leading manufacturer of the prices on Steel Goods for the season opening. It is expected that schedules will be given out at an early date. Last year, it will be remembered, there was no change in prices, but as manufacturing costs have undoubtedly increased, the opinion is expressed that the forthcoming schedule will probably show a moderate advance.

Sheet Zinc.—The reactionary movement in metals continues and the price of Sheet Zinc has again been reduced 25 cents per 100 lb., making the base price \$8.10, subject to the usual extras and discounts.

Sash Weights.—Prices on Sash Weights continue firm in most sections in spite of the reactionary tendency in raw material. Most manufacturers of this line make

other products also, which are more profitable and to which they prefer to devote their capacity. It would appear that the demand for these higher grade lines has not slackened enough to stimulate the production of weights which are firmly held not far from the high prices prevailing early in the year.

Shot.—Influenced by the weakness of the Lead market, leading Shot manufacturers have sent to the trade cards announcing a reduction in their prices of 5 cents per bag. Quotations are now as follows, subject to a discount on ton lots and upwards, of 10 cents per bag of 25 lb.:

	Per Bag.	Per bag.	Per Bag.	Per bag.
Drop Shot, sizes smaller than B.....	25 lb.	\$1.90;	5 lb.	\$0.45
Drop Shot, B and larger sizes.....	25 lb.	2.15;	5 lb.	.50
Buck and Chilled Shot.....	25 lb.	2.15;	5 lb.	.50
Dust Shot.....	25 lb.	2.40;	5 lb.	.55

Registers.—Stocks of Registers are being accumulated by manufacturers in anticipation of the fall trade, which will soon be opening up. Leading producers state that the market is in fine shape, and they expect a heavy business, as building operations continue on an extensive scale in most sections of the country. While any further advances are referred to as improbable it is believed that prices will hold very firm on the level that has been established. Jobbers' stocks are believed to be light, as they have been purchasing conservatively for several months.

Axes.—Late buyers of Axes are finding prices firmly maintained, and on the whole somewhat higher than those which prevailed at the beginning of the season. Manufacturers have been fully occupied filling contract orders, and jobbers, considering their stocks well bought, are not inclined to press sales.

Skates, Ice and Roller.—Manufacturers concur in the report that jobbers' orders for Ice Skates have been in good average volume, and factories will be kept busy turning out contract orders. Prices, under the existing arrangement among producers, hold firm, showing, it will be remembered, some advances over last season's figures on the cheaper lines. The growing tendency of enterprising retailers to anticipate their requirements of season goods is exemplified by the fact that many of them have already placed their orders, or are now taking the matter up, thus insuring ample and carefully selected stocks when needed. It is apparent thus early that there will be a heavy business in Roller Skates this fall, especially for rink use. Indications are that the popularity of roller skating is at its height, with a noticeable increase in outdoor skating, which is especially evident in the West, and manufacturers will be put to it to keep up with their orders, if indeed they do not fall behind, as was the case last season.

Rope.—Business continues moderate, although some manufacturers report a little better demand than during July. Under these conditions card prices, represented by the following quotations, are not adhered to in all instances, with the exception of Bolt and high grades of Manila Rope, which are maintained. Quotations are as follows: Pure Manila, 13 to 13½ cents; B quality, 12 to 12½ cents. Pure Sisal, 9¼ cents; No. 2 quality, 7¾ to 8 cents; No. 1 Jute, ¼ in. and up, 9 cents; No. 2 Jute, 8½ cents.

Window Glass.—Stocks in manufacturers' hands were not excessive when 80 per cent. of the productive capacity of the country closed more than a month ago. Some buying, to keep stocks assorted, has been going on since that time, and these stocks have been proportionately reduced. The National Brokerage Company does not appear to be disposed to throw its stock on the market at a loss, and it is probable that as the season advances and popular sizes of Glass become scarce that advanced prices will be asked. Should hand blown factories start by September 15, which is not at all certain to be the case, Glass could not be marketed until a month later. Buying during August and September will principally be for immediate requirements, and will have to be supplied from stocks now in manufacturers' hands. Some jobbers are advising merchants to order Glass now, in view of prospective conditions. In Greater New York

jobbers' quotations from jobbers' list, October 1, 1903, are 90 and 15 per cent. discount on all sizes, single and double strength. Western jobbers are quoting from the same list as follows: 90 and 10 per cent. discount for the first three brackets of single thick; 90 and 15 per cent. for other brackets of single thick and 90 and 20 per cent. discount for all sizes of double thick. It is understood that manufacturers' prices, from manufacturers' list, January 1, 1901, which, it will be remembered, is about 20 per cent. higher than jobbers' list, range from 90 and 5 to 90 and 10 per cent. discount on single, and 90 and 10 to 90 and 15 on double strength, according to assortment and brand.

Linseed Oil.—The market is in a weak and unsettled condition, and purchases are only for immediate requirements. Contract deliveries are confined largely to concerns who use Oil for manufacturing purposes. Present conditions offer no encouragement for speculative buying, and crushers are not soliciting business with cut prices. New York quotations are as follows: City Raw, 43 to 44 cents per gallon, according to quantity; Out of Town Raw, 40 to 43 cents per gallon for jobbing lots, according to seller, and 1 cent less for carload lots. Boiled Oil is 1 cent a gallon over Raw.

Spirits Turpentine.—The local market is without any special activity, the demand being limited. In view of short supplies at this point values have advanced 1 cent per gallon. New York quotations are as follows, according to quantity: Oil Barrels, 59 to 59½ cents; Machine Made Barrels, 59½ to 60 cents per gallon.

THE CALIFORNIA ANTI-TRUST LAW,

IN our issue of August 1, in an article concerning the California Anti-Trust law the substitution of the word "prevent" for "permit" in the last sentence of the second paragraph gave an entirely contrary meaning to what was intended, and which was at variance with the rest of the article. The proper reading should have been: "The statute unquestionably does not permit mutual agreement or concert of action on prices by parties in California, and this phase of the law is being respected." The law is designed to prevent combinations or agreements on prices of merchandise by merchants or manufacturers within the borders of California doing business under its laws, but has no effect on merchants or manufacturers outside the State.

EDWIN B. STIMPSON COMPANY.

THE EDWIN B. STIMPSON COMPANY was incorporated July 15 with authorized capital of \$100,000, all paid in, to take over the business of Edwin B. Stimpson & Sons, 31 Spruce street, New York, established many years ago. The company manufactures various kinds of Presses and Dies for punching metal, paper, cloth, leather and other materials. The officers are: Edwin B. Stimpson, president; Henry V. Rau, vice-president, and William W. Beales, secretary and treasurer, with whom John J. Mangan, Louis Lupien, Louis C. Schwensen and Harry London, long identified with the business, are associated as stockholders.

IN a circular issued under date of the 5th inst. the Colt's Patent Fire Arms Mfg. Company, Hartford, Conn., states that from time to time Automatic Pistols of foreign make are offered for sale in this country which infringe the United States letters patent owned or controlled exclusively by the company. With a view to protecting its rights in the matter the company has commenced and is prosecuting suits against the agents in the United States for several of these foreign made Pistols for the purpose of obtaining injunctions against them. The company states that while it cannot bring suit against the foreign manufacturers of these Pistols who have no place of business in this country, merchants who put such Pistols in stock can be prosecuted.

HANGING RACKS FOR TACKLE BLOCKS, BIRD CAGES, Etc.

AN original and convenient method of making racks on which to keep or display stock is illustrated in the accompanying cuts. Fig. 1 shows the contrivance

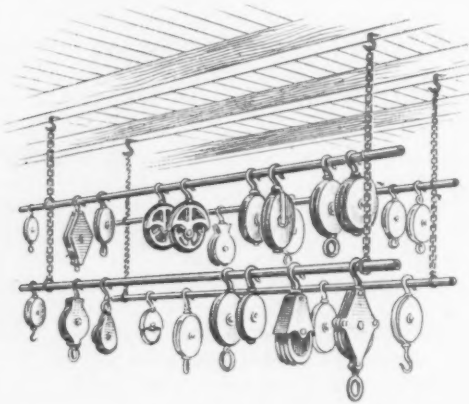


Fig. 1.—Rack for Accommodating Tackle Blocks.

erected for accommodating Tackle Blocks by the jobbing house of C. S. Mersick & Co., New Haven, Conn. Strong hooks are screwed into the cross beams of the building and from these are suspended pieces of chain connected at certain distances by iron rings. Through these rings are run lengths of bar iron over which the Blocks are hooked.

The same idea may be applied to several other lines of goods, lighter articles being accommodated by lighter chain and rods, as in the case of the Bird Cage display

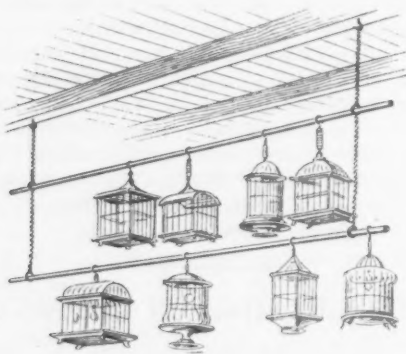


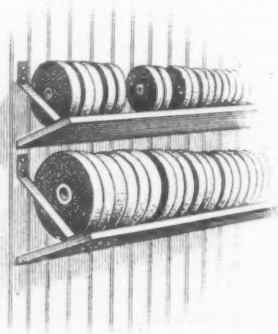
Fig. 2.—Bird Cage Display.

of Tracy, Robinson & Williams, Hartford, Conn., shown in Fig. 2. In this case small brass chain is used and the Cages are hung on light brass rods, all matching the color and material of the Bird Cages and making a very attractive stock which may be easily examined by customers for the purpose of making selection.

THE NANZ CLOCK COMPANY, 127 Duane street, New York, has recently been organized to succeed Nanz & Co., manufacturers of Watchmen's Time Detectors or Clocks. A new station box of cast iron, painted, with key to the box containing the station key, has just been brought out, to supply a demand for such a receptacle, to be installed in an exposed or outside position, and protect the watchman's station key from interference by curious or meddlesome people. The Clock itself, Imperial Watchman's Clock, has been greatly improved, profiting by practical experience, and it is now made of even better material than heretofore, thus insuring a stronger and more durable Clock. The company is now representing a manufacturer of Railroad Track Walkers' Clocks and Railroad Signal Clocks, who is also bringing out an Automatic Clock. Charles Nanz is secretary and general manager of the Nanz Clock Company.

A MERCHANT'S METHOD OF KEEPING EMERY WHEELS.

IN the store of N. T. Bushnell Company, New Haven, Conn., which does an extensive Hardware and mill supply business, may be observed a convenient method of keeping stock of Emery Wheels. These are arranged with different sizes together and in order of size in a



Emery Wheels on Inclined Shelves.

series of trough-like shelves which are built as shown in the accompanying illustration. The shelves are erected at a slight angle, so that when placed upon them the Wheels gravitate toward the inner wall and are thus held securely in place. In building such a rack it would be advisable to have the widest shelf at the bottom to accommodate the heavier wheels.

REQUESTS FOR CATALOGUES, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM J. P. MURPHY & SONS, Forest Lake, Minn., whose Hardware store and stock has recently been seriously damaged by fire.

FROM CLAIBORNE HARDWARE COMPANY, Port Gibson, Miss., which intends adding to its stock a line of Paints, Varnishes, &c.

FROM THE FARMERS' HARDWARE COMPANY, Jonesville, S. C., which has been organized with a capital stock of \$5000. The company carries Shelf and Heavy Hardware, Stoves, Agricultural Implements, Paints, Sporting Goods, &c.

AMONG THE HARDWARE TRADE.

The Bay City Hardware Company, Ltd., Bay City, Mich., wholesale Hardware, was recently visited by fire, which inflicted a loss estimated at from \$40,000 to \$50,000. Future plans of the company are not determined, and, pending the adjustment of insurance, it has not been decided whether the business will be resumed or not.

The Hardware store and business of C. D. Hammond, Goldthwaite, Texas, who was recently drowned in the Colorado River while attempting to rescue a young woman, has been sold to O. H. and Lee Yarborough, who will continue the business under the firm name of Yarborough Brothers.

The Frank P. Hall Company has bought out the Elliott & Harris Hardware Company, Columbus, Ohio, and the former company will move to the storeroom heretofore occupied by the latter at 115 South High street. As a result of the merger the Hall Company will be reorganized and E. L. Harris elected on the Board of Directors.

JOHN PRITZLAFF HARDWARE COMPANY'S CATALOGUE.

THE JOHN PRITZLAFF HARDWARE COMPANY, Milwaukee, Wis., has just issued its general catalogue No. 4, relating to Hardware, Cutlery, Sporting Goods, Iron, Metals, &c. The catalogue is well printed and attractively and substantially bound, and is a very large volume, containing as it does nearly 2100 pages. The frontispiece is a fine portrait of John Pritzlaff, who founded the business in 1850. This is followed by a view of the imposing establishment of the company, with a frontage of 250 ft. on West Water street and 300 ft. on Fowler street. The company states that it will at intervals issue lists giving approximate prices on all goods illustrated and described in the catalogue. The index to the volume comprises nearly 50 pages, the great variety

STANDARD FOR MACHINE SCREWS AND MACHINE SCREW TAPS AND DIES.

WE reproduce herewith the standard for Machine Screws and Machine Screw Taps and Dies as approved and accepted by the American Society of Mechanical Engineers May 29 last, and recommended by the leading tap makers of the country. Heretofore there has been no known standard acknowledged as such with a constant or formula by which the exact sizes could be determined. This standard, therefore, coming as it does from the American Society of Mechanical Engineers, will overcome a defect of long standing and will be welcomed by users of machine screws who will soon be able to buy standard screws in the open market made to within known limits and a universal formula. We are advised by the J. M. Carpenter Tap & Die Company, Pawtucket,

STANDARD SCREWS											
No.	NEW	OUTSIDE DIAMETERS			PITCH DIAMETERS			ROOT DIAMETERS			Top Drill Diameters
		Minimum	Maximum	Difference	Minimum	Maximum	Difference	Minimum	Maximum	Difference	
0	0.00-0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	0.01-0.01	0.010	0.010	0.000	0.010	0.010	0.000	0.010	0.010	0.000	0.010
2	0.02-0.02	0.020	0.020	0.000	0.020	0.020	0.000	0.020	0.020	0.000	0.020
3	0.03-0.03	0.030	0.030	0.000	0.030	0.030	0.000	0.030	0.030	0.000	0.030
4	0.04-0.04	0.040	0.040	0.000	0.040	0.040	0.000	0.040	0.040	0.000	0.040
5	0.05-0.05	0.050	0.050	0.000	0.050	0.050	0.000	0.050	0.050	0.000	0.050
6	0.06-0.06	0.060	0.060	0.000	0.060	0.060	0.000	0.060	0.060	0.000	0.060
7	0.07-0.07	0.070	0.070	0.000	0.070	0.070	0.000	0.070	0.070	0.000	0.070
8	0.08-0.08	0.080	0.080	0.000	0.080	0.080	0.000	0.080	0.080	0.000	0.080
9	0.09-0.09	0.090	0.090	0.000	0.090	0.090	0.000	0.090	0.090	0.000	0.090
10	0.10-0.10	0.100	0.100	0.000	0.100	0.100	0.000	0.100	0.100	0.000	0.100
11	0.11-0.11	0.110	0.110	0.000	0.110	0.110	0.000	0.110	0.110	0.000	0.110
12	0.12-0.12	0.120	0.120	0.000	0.120	0.120	0.000	0.120	0.120	0.000	0.120
13	0.13-0.13	0.130	0.130	0.000	0.130	0.130	0.000	0.130	0.130	0.000	0.130
14	0.14-0.14	0.140	0.140	0.000	0.140	0.140	0.000	0.140	0.140	0.000	0.140
15	0.15-0.15	0.150	0.150	0.000	0.150	0.150	0.000	0.150	0.150	0.000	0.150
16	0.16-0.16	0.160	0.160	0.000	0.160	0.160	0.000	0.160	0.160	0.000	0.160
17	0.17-0.17	0.170	0.170	0.000	0.170	0.170	0.000	0.170	0.170	0.000	0.170
18	0.18-0.18	0.180	0.180	0.000	0.180	0.180	0.000	0.180	0.180	0.000	0.180
19	0.19-0.19	0.190	0.190	0.000	0.190	0.190	0.000	0.190	0.190	0.000	0.190
20	0.20-0.20	0.200	0.200	0.000	0.200	0.200	0.000	0.200	0.200	0.000	0.200
21	0.21-0.21	0.210	0.210	0.000	0.210	0.210	0.000	0.210	0.210	0.000	0.210
22	0.22-0.22	0.220	0.220	0.000	0.220	0.220	0.000	0.220	0.220	0.000	0.220
23	0.23-0.23	0.230	0.230	0.000	0.230	0.230	0.000	0.230	0.230	0.000	0.230
24	0.24-0.24	0.240	0.240	0.000	0.240	0.240	0.000	0.240	0.240	0.000	0.240
25	0.25-0.25	0.250	0.250	0.000	0.250	0.250	0.000	0.250	0.250	0.000	0.250
26	0.26-0.26	0.260	0.260	0.000	0.260	0.260	0.000	0.260	0.260	0.000	0.260
27	0.27-0.27	0.270	0.270	0.000	0.270	0.270	0.000	0.270	0.270	0.000	0.270
28	0.28-0.28	0.280	0.280	0.000	0.280	0.280	0.000	0.280	0.280	0.000	0.280
29	0.29-0.29	0.290	0.290	0.000	0.290	0.290	0.000	0.290	0.290	0.000	0.290
30	0.30-0.30	0.300	0.300	0.000	0.300	0.300	0.000	0.300	0.300	0.000	0.300
31	0.31-0.31	0.310	0.310	0.000	0.310	0.310	0.000	0.310	0.310	0.000	0.310
32	0.32-0.32	0.320	0.320	0.000	0.320	0.320	0.000	0.320	0.320	0.000	0.320
33	0.33-0.33	0.330	0.330	0.000	0.330	0.330	0.000	0.330	0.330	0.000	0.330
34	0.34-0.34	0.340	0.340	0.000	0.340	0.340	0.000	0.340	0.340	0.000	0.340
35	0.35-0.35	0.350	0.350	0.000	0.350	0.350	0.000	0.350	0.350	0.000	0.350
36	0.36-0.36	0.360	0.360	0.000	0.360	0.360	0.000	0.360	0.360	0.000	0.360
37	0.37-0.37	0.370	0.370	0.000	0.370	0.370	0.000	0.370	0.370	0.000	0.370
38	0.38-0.38	0.380	0.380	0.000	0.380	0.380	0.000	0.380	0.380	0.000	0.380
39	0.39-0.39	0.390	0.390	0.000	0.390	0.390	0.000	0.390	0.390	0.000	0.390
40	0.40-0.40	0.400	0.400	0.000	0.400	0.400	0.000	0.400	0.400	0.000	0.400
41	0.41-0.41	0.410	0.410	0.000	0.410	0.410	0.000	0.410	0.410	0.000	0.410
42	0.42-0.42	0.420	0.420	0.000	0.420	0.420	0.000	0.420	0.420	0.000	0.420
43	0.43-0.43	0.430	0.430	0.000	0.430	0.430	0.000	0.430	0.430	0.000	0.430
44	0.44-0.44	0.440	0.440	0.000	0.440	0.440	0.000	0.440	0.440	0.000	0.440
45	0.45-0.45	0.450	0.450	0.000	0.450	0.450	0.000	0.450	0.450	0.000	0.450
46	0.46-0.46	0.460	0.460	0.000	0.460	0.460	0.000	0.460	0.460	0.000	0.460
47	0.47-0.47	0.470	0.470	0.000	0.470	0.470	0.000	0.470	0.470	0.000	0.470
48	0.48-0.48	0.480	0.480	0.000	0.480	0.480	0.000	0.480	0.480	0.000	0.480
49	0.49-0.49	0.490	0.490	0.000	0.490	0.490	0.000	0.490	0.490	0.000	0.490
50	0.50-0.50	0.500	0.500	0.000	0.500	0.500	0.000	0.500	0.500	0.000	0.500
51	0.51-0.51	0.510	0.510	0.000	0.510	0.510	0.000	0.510	0.510	0.000	0.510
52	0.52-0.52	0.520	0.520	0.000	0.520	0.520	0.000	0.520	0.520	0.000	0.520
53	0.53-0.53	0.530	0.530	0.000	0.530	0.530	0.000	0.530	0.530	0.000	0.530
54	0.54-0.54	0.540	0.540	0.000	0.540	0.540	0.000	0.540	0.540	0.000	0.540
55	0.55-0.55	0.550	0.550	0.000	0.550	0.550	0.000	0.550	0.550	0.000	0.550
56	0.56-0.56	0.560	0.560	0.000	0.560	0.560	0.000	0.560	0.560	0.000	0.560
57	0.57-0.57	0.570	0.570	0.000	0.570	0.570	0.000	0.570	0.570	0.000	0.570
58	0.58-0.58	0.580	0.580	0.000	0.580	0.580	0.000	0.580	0.580	0.000	0.580
59	0.59-0.59	0.590	0.590	0.000	0.590	0.590	0.000	0.590	0.590	0.000	0.590
60	0.60-0.60	0.600	0.600	0.000	0.600	0.600	0.000	0.600	0.600	0.000	0.600
61	0.61-0.61	0.610	0.610	0.000	0.610	0.610	0.000	0.610	0.610	0.000	0.610
62	0.62-0.62	0.620	0.620	0.000	0.620	0.620	0.000	0.620	0.620	0.000	0.620
63	0.63-0.63	0.630	0.630	0.000	0.630	0.630	0.000	0.630	0.630	0.000	0.630
64	0.64-0.64	0.640	0.640	0.000	0.640	0.640	0.000	0.640	0.640	0.000	0.640
65	0.65-0.65	0.650	0.650	0.000	0.650	0.650	0.000	0.650	0.650	0.000	0.650
66	0.66-0.66	0.660	0.660	0.000	0.660	0.660	0.000	0.660	0.660	0.000	0.660
67	0.67-0.67	0.670	0.670	0.000	0.670	0.670	0.000	0.670	0.670	0.000	0.670
68	0.68-0.68	0.680	0.680	0.000	0.680	0.680	0.000	0.680	0.680	0.000	0.680
69	0.69-0.69	0.690	0.690	0.000	0.690	0.690	0.000	0.690	0.690	0.000	0.690
70	0.70-0.70	0.700	0.700	0.000	0.700	0.700	0.000	0.700	0.700	0.000	0.700
71	0.71-0.71	0.710	0.710	0.000	0.710	0.710	0.000	0.710	0.710	0.000	0.710
72	0.72-0.72	0.720	0.720	0.000	0.720	0.720	0.000	0.720	0.720	0.000	0.720
73	0.73-0.73	0.730	0.730	0.000	0.730	0.730	0.000	0.730	0.730	0.000	0.730
74	0.74-0.74	0.740	0.740	0.000	0.740	0.740	0.000	0.740	0.740	0.000	0.740
75	0.75-0.75	0.750	0.750	0.000	0.750	0.750	0.000	0.750	0.750	0.000	0.750
76	0.76-0.76	0.760	0.760	0.000	0.760	0.760	0.000	0.760	0.760	0.000	0.760
77	0.77-0.77	0.770	0.770	0.000	0.770	0.770	0.000	0.770	0.770	0.000	0.770
78	0.78-0.78	0.780	0.780	0.000	0.780	0.780	0.000	0.780	0.780	0.000	0.780
79	0.79-0.79	0.790	0.790	0.000	0.790	0.790	0.000	0.790	0.790	0.000	0.790
80	0.80-0.80	0.800	0.800	0.000	0.800	0.800	0.000	0.800	0.800	0.000	0.800
81	0.81-0.81	0.810	0.810	0.000	0.810	0.810	0.000	0.810	0.810	0.000	0.810
82	0.82-0.82	0.820	0.820	0.000	0.820	0.820	0.000	0.820	0.820	0.000	0.820
83	0.83-0.83	0.830	0.830	0.000	0.830	0.830	0.000	0.830	0.830	0.000	0.830
84	0.84-0.84	0.840	0.840	0.000	0.840	0.840	0.000	0.840	0.840	0.000	0.840
85	0.85-0.85	0.850	0.850	0.000	0.850	0.850	0.000	0.850	0.850	0.000	0.850
86	0.86-0.86	0.860	0.860	0.000	0.860	0.860	0.000	0.860	0.860	0.000	0.860
87	0.87-0.87	0.870	0.870	0.000	0.870	0.870	0.000	0.870	0.870	0.000	0.870
88	0.88-0.88	0.880	0.880	0.000	0.880	0.880	0.000	0.880	0.880	0.000	0.880
89	0.89-0.89	0.890	0.890	0.000	0.890	0.890	0.000	0.890	0.890	0.000	0.890
90	0.90-0.90	0.900	0.900	0.000	0.900	0.900	0.000	0.900	0.900	0.000	0.900
91	0.91-0.91	0.910	0.910	0.000	0.910	0.910	0.000	0.910	0.910	0.000	0.910
92	0.92-0.92	0.920	0.920	0.000	0.920	0.920	0.000	0.920	0.920	0.000	0.920
93	0.93-0.93	0.930	0.930	0.000	0.930	0.930	0.000	0.930	0.930	0.000	0.930
9											

BUYING SEASON GOODS.

THERE is considerable diversity in the practice of merchants in purchasing season goods, owing to the size of their business and the part of the country in which they are located. The time of buying seasonable goods depends somewhat on whether they are purchased from jobbers or manufacturers. Merchants whose requirements are moderate often buy such goods in small quantities about as demanded by their trade, letting the jobber carry the stock until the retailer has immediate use for them. The prevalence of combines or trusts has resulted in more of an uniformity in prices than when

Being Forehanded.

A schedule of requirements for the various months of the year is a great help in ordering, so that goods may be on hand and displayed before the time of actual demand. When customers want to buy they will have had it impressed upon their memories that they have seen the goods displayed in such or such a store. The merchant who has goods promptly in stock at the time they are required is the one who gets the business.

Seasonable Goods Table.

In Fig. 1 of the accompanying illustrations is shown part of a Buying Table of Seasonable Goods in use by

Buying Table of Seasonable Goods			
JAN.	FEB.	MAR.	APR.
Poultry Netting	Lawn Mowers (ship)	Ladders	Fishing Tackle
Wire Cloth	Paints	Brushes Paint	Lawn Tools
Steel Goods	Barrows	Carpet Beaters	" Fertilizers
Pruners		Brooms	Hose
		Jap-a-Lac.	Floral Sets
			Bouquet Holders
			Refrigerator Pans
			Baskets
			Sprinklers
	Specify Netting Cloth		
MAY.	JUN.	JULY.	AUG.
Screens & Doors	Spargers & Blanks	Paraffine Wax	Walk Seed
Spring Hinges			Waxed Paper
Scythes			

Fig. 1.—Buying Table of Seasonable Goods.

Push.			
JAN.	FEB.	MAR.	APR.
Kitchen Goods Sale	Pruners	Paint	Seed
	March Preparations	Alabaster	Scything
			Garden Tools
			Wheel Barrows
Inventory Clearance		Home Cleaning Windows	
		Have Seed Ready	Dog Collars

Fig. 2.—Goods to Be Pushed.

there was not a community of interests among manufacturers in the same lines.

Improved Facilities.

The multiplicity of jobbing houses and improved transportation facilities make the necessity of ordering season goods far ahead less imperative than formerly, especially by the smaller merchants. Some merchants contract for season goods whenever they consider that the market offers the best inducements in the way of prices, deliveries, &c., even if ahead of time.

No rule can be laid down which will apply to all merchants, as various localities demand different lines of season goods, and at different times, so that what would be required for any month at a Southern point, for instance, would not be the same as at a town located further North.

Nelson I. Haskell, Lynn, Mass., which, while not elaborate, satisfactorily answers the requirements of his business. The complete table includes the following items:

January.	April.
Poultry Netting.	Fishing Tackle.
Wire Cloth.	Lawn Tools, Hooks, Shears.
Steel Goods.	Lawn Fertilizers.
Pruners.	Hose.
February.	Floral Sets.
Lawn Mowers. ship April.	Bouquet Holders.
Paints.	Refrigerator Pans.
Barrows.	Baskets.
Specify Netting and Cloth.	Sprinklers.
March.	May.
Ladders.	Screens and Doors.
Paint Brushes.	Spring Hinges.
Carpet Beaters.	Scythes.
Brooms.	Hammocks.
Jap-a-Lac.	Freezers.

Water Coolers.
Fruit Jars and Rings.
Oil Stoves and Wicks.
Paris Green.
Hellebone.

June.
Revolvers.
Blank Cartridges.
Cow Bells and Horns.

July.
Paraffine Wax.
Fruit Pickers.

August.
Bulk Seed.
Tarred Paper.
Lanterns.
Conductors (stock).
Wood Saws.
Axes.

September.
Coal Hods.
Coal Shovels and Scoops.
Sieves.
Ash Cans.
Stove Boards.

Glass, Look up stock.
Gas Mantles and Supplies.
Electrical Supplies.
Snow Shovels, ship Nov. 20.
Ammunition.
Guns and Rifles.
Air Rifles and Shot.

October.
Food Choppers.
Roasters.
Wood Faucets.
Weather Strip.
Sunflower Seed.

November.
Nickelware.
Holiday Stock.
Cutlery.
Thermometers.
Sleds and Skates.
Fancy Bronzes.
Hockeys, Rawhide.
Tool Cabinets.
Paper Seed.

December.
Kitchen Goods for January sale.

Goods to Push.

In Fig. 2 is shown a part of a page used by Mr. Haskell which is devoted to the goods to be pushed in the

Tools, Chests, Carpenter, Fancy. Snow Shovels.
Fancy Paints, Bronzes, Twine. Sad Irons and Wringers.
Kits, Cobblers', Soldering. Boilers and Sweepers.

The sheets are 8 x 10 1/4 in. in size, with holes punched at the top, and are kept in a loose leaf binder with other sheets containing prices of goods. The "Seasonable Table" and "Goods to Push" sheets are kept in the front end of the book and are thus convenient to refer to, and then to look up stock to assure of goods being ordered in time to have them on hand when needed.

Window Dressing.

The tables are also used in arranging for window displays, as requirements for this purpose are anticipated and plans are made beforehand so that the goods can readily be put in the show windows when the right time arrives.

Price Book.

A part of the first page of Mr. Haskell's price book is shown in Fig. 3. The leaves are the same size as those used for the tables. Awls take the upper half of the page, as shown, while the lower left hand is devoted to

	Cost	Sell	
Awls			
Broad set #33	22.5 per	28 doz 3.00	Brd 1.00 1 per
" Handled #100's	68 doz	10 "	B + P Cr 4.00 1 doz
" " #2	29 "	10 "	7.00 2.5
Hammer Cost #53	111 per	15 doz 2.00	B + P Cr 5.00 1 per
55	111 "	" "	" " 1 "
Pegging Cost #141	50 "	" "	F.P. Cr 9.00 1 "
Shaving Cost #51	111 "	" "	B.P. Cr 12.00 1 "
Paratch #10	25 doz	10 doz	B.P. Cr 10.00 2 doz
+ Bee Pack	75 "	10 "	Shim 6.00 2.5

Fig. 3.—Part of a Page from the Price Book.

different months of the year, the list for the entire year being as follows:

January.
Kitchen Goods.
Inventory clean-up.
February.
Pruners.
Moth Preparations.
March.
Paint.
Alabastine.
House Cleaning Window.
Have Seed ready.
April.
Seed.
Fencing.
Garden Tools.
Wheelbarrows.
Dog Collars.
May.
Wire Cloth.
Steel Goods.
Screen Black.
Lawn Tools.
Bouquet Holders.
Sprinklers.
Refrigerator Pans.
June.
Lawn Mowers.
Lawn Hose.
Lawn Tools, Wood Rakes.
Ice Picks and Tongs.
Grass Catchers.
Hay Tools.
Lunch Baskets.
17th and 4th Goods.
Cork Screws.

July.
Recreation Window.
Hammocks.
Freezers.
August.
Wall Paper, Jobs.
Fruit Jars and Canning Display.
Smelting Kits.
September.
Dry Measures.
Hennery Supplies.
Lanterns.
Gas Supplies.
October.
Gunning Display.
Rat Traps.
Ash Cans and Sieves.
Coal Hods.
Garbage Pails.
Glass (sign).
November.
Razors and Strops.
Axes and Wood Saws.
Poppers.
Roasters.
Carvers.
Nut Cracks and Picks.
December.
Nickelware.
Cutlery, Pocket, Table, Shaving.
Guns, Fishing Rods.
Dog Collars.
Skates, Sleds, Hockeys.
Watches, Thermometers.
Wagons.

Axes. At the lower left hand corner of the page the contents of the page is indexed thus:

AWLS, AXES.

In this connection it may be of interest to learn that the loose leaf binder was made to order by a local book-binder, and consists of heavy pasteboard covered with imitation leather, the covers and loose leaf pages being held together with two small brass screws. The covers and 500 sheets, with stock horizontal ruling, cut and punched to size, cost \$1.90.

E. B. ESTES & SONS are now settled in their new quarters at 74 Warren street, New York, where the business is concentrated under one roof, instead of being partially scattered in adjacent buildings, as heretofore. At the present location, which is particularly easy of access by elevated, surface and subway lines, they have the entire building, five floors and two basements, each about 25 x 100 ft. This business was established in 1847 and includes the manufacture of all kinds of turned wooden goods, square goods, locked corner boxes and specialties of analogous nature in domestic or fancy foreign woods. They also manufacture Toothpicks, Toys and Enameled Wood-work.

THE CRAWFORDSVILLE HARDWARE COMPANY, Crawfordsville, Ind., has been incorporated, with \$18,000 capital stock. The incorporators are Thos. J. Houlihan, Wm. A. Moon and Elbert M. Morrow.

The Trades 100 Years Ago.

Second Article.

The following article with the accompanying illustration is taken from the "Book of Trades, or Library of the Useful Arts," which was published in 1807 by Jacob Johnson, London, and at that time for sale in his book-stores in Philadelphia and Richmond, Va.

The Wire-Drawer.

Metal wires are frequently drawn so fine as to be wrought with other threads of silk, wool or hemp, and thus they become a considerable article in the manufacture. The metals most commonly drawn into wire are gold, silver, copper and iron.

Silver wire and gold wire are the same except that the latter is covered with gold. There are also counterfeit gold and silver wires, made of copper gilt and silvered over.

The business of a wire drawer is thus performed: If it is gold wire that is wanted an



Wire Drawer

ingot of silver is double gilt, and then by the assistance of a mill it is drawn into wire. The mill consists of a steel plate perforated with holes of different dimensions, and a wheel which turns the spindles. The ingot, which at first is but small, is passed through the largest hole and then through one a degree smaller, and so continued till it is drawn to a required fineness; and it is all equally gilt if drawn out as fine as a hair.

The next operation is that of the flattening mill, which consists of two perfectly round and exquisitely polished rollers, formed internally of iron and welded over with a plate of refined steel; these rollers are placed with their axes parallel and their circumferences nearly in contact; they are both turned with one handle; the lowermost is about ten inches in diameter, the upper about two, and they are something more than an inch in thickness. The wire unwinding from a bobbin and passing between the leaves of a book gently pressed and through a narrow slit in an up-

right piece of wood called a ketch, is directed by a small conical hole in a piece of iron called a guide, to any particular part of the width of the rollers, some of which are capable of receiving by this contrivance forty threads. When the wire is flattened between the rollers it is wound again on a bobbin, which is turned by a wheel fixed on the axis of one of the rollers, and so proportioned that the motion of the bobbin just keeps pace with that of the rollers.

Brass and copper wire is drawn in a similar manner to that already described. Of the brass wire there are many sizes, suited to different kinds of work. The finest is used for the strings of musical instruments. Pin makers also use great quantities of wires of several sizes to make pins of.

Iron wire is made from bars of iron, which are first drawn out to a greater length, to about the thickness of half an inch in diameter, at a furnace with a hammer gently moved by water. These thinner pieces are bored round and put into a furnace to anneal. A very strong fire is necessary for this operation.

They are then delivered to the workmen called rippers, who draw them into wire through two or three holes, and then annealed a second time, after which they are to be drawn into wire of the thickness of a pack thread; after this they are again to be annealed and then delivered to the small wire drawers. The plate in which the holes are is iron on the outside and steel on the inside surface, and the wire is anointed with oil to make it run the easier. The first iron that runs from the stone when melting being the softest and toughest is usually preserved to make wire of.

It is difficult to determine the period when attempts were first made to draw into threads metal cut or beat into small slips by forcing them through holes in a steel plate. It should appear that as long as the work was performed by the hammer the artists at Nuremberg were called wiresmiths, but after the invention of drawing iron they were denominated wire drawers or wiremillers. Both these appellations occur in history so early as the year 1351; therefore, the invention must have been known in the fourteenth century.

At first threads exceedingly massy were employed for weaving and embroidery; it is not at all known when the flattened metal wire began to be spun round linen or silk thread. The spinning mill by which the labor is now performed is a contrivance of great ingenuity.

The wire first spun about thread was round, and the invention of previously making the wire flat is probably a new epoch in the history of the art; and it is a curious fact that three times as much silk can be covered by flattened as by round wire, so that various ornamental articles are cheap in the same proportion. Besides the brightness of the metal is heightened in an uncommon degree and the article becomes much more beautiful.

The greatest improvement ever made in this art was undoubtedly the invention of the large drawing machine, which is driven by water or by steam, and in which the axle-tree by means of a lever moves a pair of pincers that open as they fall against the drawing plate, lay hold of the wire, which is guided through a hole of the plate, shut

as they are drawn back, and in that manner pull the wire along with them.

Wiredrawing in all its branches is profitable to the master, and to the workman it is a good business, being a trade that is not exposed to the weather; that can be carried on at all seasons of the year, and by which he can earn from one guinea to double that sum in a week.

Hardware Window Display

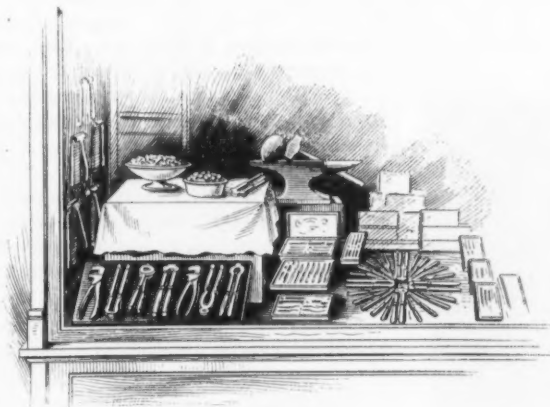
Eighteenth Article.

NOVELTIES.

NO class of goods needs to be displayed with so much skill either in the show window or inside the store as novelties. No class requires for successful handling so much intelligent effort and good salesmanship. The term novelties, as used by the trade, is a broad one, and includes a variety of commodities. In a general way, however, it usually means new devices for special use, or for doing things in a quicker and more convenient way.

Methods of displaying several articles which may be classed as novelties have been described in previous articles. Many principles applied to one such line may be equally well applied to dozens of others. In nine cases out of ten novelties should be demonstrated either by displaying them in actual use with some one to operate them, or by putting them in a position which suggests use and shows how they work. This

Shown in Use. is the method usually employed by most merchants and manufacturers. Men shaving with new styles of Safety Razors have become common figures in store windows. A new Mop Wringer in operation may be easily shown. An Apple or Potato Parer may be shown with its work half done, the implement in-



A Cracking Display.

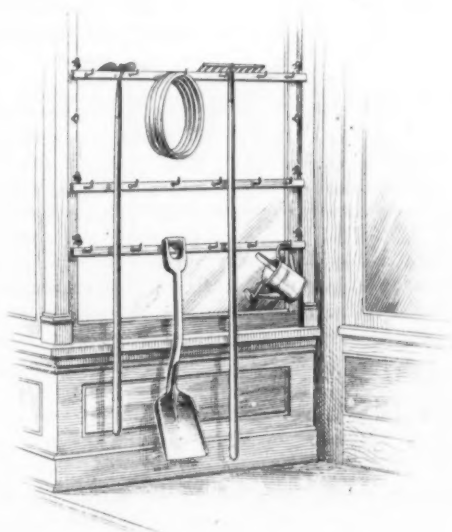
serted in the actual fruit and a dish of same placed near by. The more natural and lifelike the surroundings of such a display the better. Take, for example, Nut Crackers, shown with a dish of half cracked nuts, as represented herewith, which make an excellent window for the fall of the year. Various styles and sizes of Cracks are shown, some loose and some grouped in neat designs, while a few handsome box sets of Cracks and Picks are wisely included. A big Anvil or a Flat Iron with a Hammer lying on it suggests the old-fashioned uncomfortable way. These object lessons appeal both to the eye and the imagination and will prove far more effective in selling the article in question than if it were simply laid in the showcase or hung in the window without special attention being called to it. People will stop and look at it, talk about its merits

and fancy that it is just what they need at home. The next step is inside the door, and another customer is made. It is a good plan to have one or two of these object lessons frequently in the window, changing them often, so that

people will get in the habit of looking out for the last new thing. When a person sees what an article can do, and is assured of its real utility, he is half way toward buying it, provided the price is within his reach.

HANGING RACKS OUTSIDE THE WINDOW.

An excellent and practical method of using the space at the side of a show window is shown herewith, representing an idea of I. P. Terry & Son, whose handsome modern establishment is located in Ansonia, Conn. As in the case of many stores the windows of this firm project diagonally beyond the doorway and have glass on the side walls as well as in front. On the frame of the side window are secured several pairs of screw eyes set up at different heights, and into these as occasion demands are hooked hooks and eyes attached to strips of board the proper length to fit the window, and painted to match the woodwork of the building. These strips contain hooks on which articles may be hung for dis-

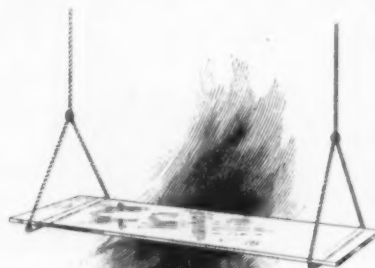


Detachable Racks Outside a Show Window.

play, while some goods, such as Garden Tools, &c., may be hung over the strips without the use of the hooks. The advantages of this arrangement are that it can be quickly put up and taken down, the racks may be set at any desired height, according to the goods to be accommodated, and they obstruct very little of the view of the window behind.

HANGING GLASS SHELF.

An exceedingly convenient and practical window display method is illustrated herewith, showing how a glass



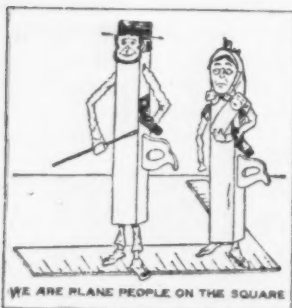
Method of Hanging a Glass Shelf.

shelf may be hung in a window for the display of various kinds of goods. The supports for this shelf are made of small chain; nickel or brass may be used or some less attractive article may be covered with cloth

or crepe paper. The chains are attached to hooks in the ceiling and at the bottom run through short pieces of pipe, forming supports which should also be inclosed in the covering material. On the two supports thus contrived the shelf is suspended, being, of course, cut the proper length and width and made of good substantial plate glass for best effect. The advantage of such a shelf is not only the ease with which it may be put up or taken down, but also the fact that it offers scarcely any obstruction to the view and affords a bright background for articles displayed.

DOING BUSINESS ON THE SQUARE.

ON its letter heads, in store circulars and in other ways the Aberdeen Hardware Company, Aberdeen, S. D., makes use of the cut reproduced herewith. The pictorial portion of the cut is not original with the firm, but the wording "We Are Plane People on the Square" is.



In its dealings with customers the company endeavors to substantiate this rugged declaration of conscientious purpose, and it is believed that the use of the cut, dating back as it does to the establishment of the store, has been an effective and beneficent reminder of the business of the firm and the principles on which it is conducted.

ENAMELED WARE WINDOW DISPLAY.

A SHORT time since Acer & Whedon, Medina, N. Y., had a special Enameled Ware sale which attracted much attention, and as a result of the enterprise and energy with which it was conducted and brought to the



Enameled Ware Window Display of Acer & Whedon.

attention of the public, a large quantity of the goods was disposed of. A good deal of advertising space was occupied in the local paper and in conjunction therewith the effective window exhibit reproduced herewith was contrived. The window is 8½ ft. wide by 5 ft. in depth. Two inch mesh Poultry Netting was used on the top of the window and from it the different articles shown were suspended. Articles on the left side of the window were hung on Nails. With the steps, which are a regular fea-

ture of the store's window, and the floor surrounding them a large and interesting assortment of the ware was shown to advantage. The back of the window was in green, while all the Enameled Ware shown was of the light gray style.

PRICE-LISTS, CIRCULARS, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, etc., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

BLACKLOCK FOUNDRY, South Pittsburg, Tenn.: Illustrated catalogue relating to Sad Irons, Country and Stove Hollowware, Shoe Lasts and Stands, Sugar Kettles, English Pots, Andirons, Kitchen and Corner Sinks, Grates, &c.

HENDEE WIRE BRUSH COMPANY, 317-319 Milwaukee street, Milwaukee, Wis.: Catalogue No. 12, relating to a large line of Bristle, Hair, Fiber and Wire Brushes.

AMERICAN SPIRAL SPRING & MFG. COMPANY, Pittsburgh, Pa.: Catalogue devoted to Extension, Compression and Torsion Springs. The company manufactures Springs of every description, adapted to a wide range of uses.

G. W. GRIFFIN & Co., Franklin, N. H., John H. Graham & Co., 113 Chambers street, New York, sales representatives: Illustrated price-list of Hack Saw Blades and Frames, Coping Saws, Bracket Saws, Band Saws for metals, &c.

JOHN N. HAGER, Fort Atkinson, Wis.: Illustrated catalogue of Malleable Iron Brackets for accommodating and displaying steel goods, Shovels, &c., in a Hardware store.

INTERNATIONAL SILVER COMPANY, successor to Rogers & Bro., Waterbury, Conn.: New and revised illustrated price-list, No. 80, 102 pages, showing the complete line of the Star brand Electro Silver Plated Spoons, Forks, Knives, &c., trademarked Rogers & Bro. A-1. The company will be pleased to send a copy of this catalogue on application and also other illustrated circulars, including booklet, "Advertising Hints and Suggestions," showing a number of attractive announcements for use by merchants in local newspapers. Advertising electrotypes will also be furnished to merchants free of charge.

GALTON MFG. COMPANY, Cleveland, Ohio: Illustrated catalogue covering an extensive line of Brooms and Brushes made of flat and round wire, bristle or fiber.

RACINE MALLEABLE & WROUGHT IRON COMPANY, Racine, Wis.: Illustrated catalogue and price-list No. 5, referring to Steel Wagon Hardware, Ironed Neck Yokes, Single-trees, Eveners, &c.

BRASS GOODS MFG. COMPANY, Brooklyn, N. Y., represented by Graham & Berwin, 7 Warren street, New York: Illustrated catalogue of 177 pages, showing comprehensive line of brass and bronze Builders', Cabinet and Refrigerator Hardware and Trimmings for Chests and

Boxes. This company has also long made a feature of manufacturing many special metal goods to order when in quantities sufficient to warrant such production.

CHARLES PARKER COMPANY, Meriden, Conn., and 32 Warren street, New York: Illustrated folders of Swivel and Stationary Pipe Vises, Reinforced Slide, Solid Jaw Vise, and the Parker Sleeve Ratchet for Square Shank Drills.

Diminished Expansion of R. F. D. Service.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C. August 6, 1907.

THE forthcoming annual report of the Fourth Assistant Postmaster General will contain an exhibit that cannot fail to be highly gratifying to the retailers in the Hardware and other trades. It will show that the rate of expansion of the rural free delivery service has not only reached its maximum, but is now declining more rapidly than it rose, and that hereafter the gain will be only proportionate to the annual increase in population.

The significance of these figures can hardly be overestimated from the standpoint of the local merchant. When the service was first authorized by Congress its rate of expansion was phenomenal, the gain ranging from a few hundred routes during the first year or two to nearly 10,000 in 1904, the result being that the methods of trade in many sections were completely revolutionized. As this enormous rate of increase was coincident with the development of the giant mail order houses it is not surprising that many retail merchants in all parts of the country should have been driven out of business and that many more should have keenly felt the influence of this competition. With astonishing demonstration of pluck and adaptability retailers everywhere have adjusted themselves to the new conditions and in the future the influence of the rural free delivery as an adverse factor in retail merchandising may safely be disregarded.

A Net Gain of But 2,000 Odd Routes.

The rural service for the fiscal year ended June 30, 1907, made a net gain of only 2004 routes, as compared with a gain of 9447 in 1904, when the maximum rate of expansion was reached. The total number of routes in operation July 1, 1907, was 37,770, as compared with 35,766 on the corresponding date a year ago. During the fiscal year 1907 362 routes were discontinued on the ground that the public necessity did not warrant the service. The promptness with which unnecessary routes are now being cut off is additional evidence of the intention of the Post Office Department to put the rural service on a strictly business basis.

The following table, compiled by the Superintendent of the Rural Free Delivery Service for the correspondent of *The Iron Age*, shows the number of routes in force on July 1 of the fiscal years 1901 to 1907, inclusive, together with the net increase during the year:

No. routes.	Gain.	No. routes.	Gain.
1901..... 4,301	3,025	1905..... 32,055	7,490
1902..... 8,466	4,165	1906..... 35,766	3,711
1903..... 15,119	6,653	1907..... 37,770	2,004
1904..... 24,565	9,446		

From this table it will be seen that the decline in the rate of expansion since 1904 has been very rapid. Of course it is not to be expected that this decrease will continue, for there must necessarily always be a small annual increase in this branch of the postal service proportionate to the growth of the country. For the current fiscal year it is estimated that not to exceed 1800 new routes will be established, and it is possible that the number will not exceed 1500.

It should not be understood that the decreased rate of expansion is due solely to the conservative policy of the Post Office Department; indeed, if this were true it would not be particularly reassuring, for a new administration might change the policy on very short notice. As a matter of fact the service has been installed so rapidly that the Department has now succeeded in covering practically every section of the country in which a minimum of 100 families per 25 miles of route can be found. This rule for the approval of new petitions for service was adopted several years ago and has been found very satisfactory. In all sections where its application operates to deny the installation of the service it has been found that pressure therefor is not strong enough to seriously embarrass the Department.

A Bird's-Eye View

of the free delivery service, together with the rate of expansion during the fiscal year just ended, may be gathered from the following table, which shows the States in which more than 1000 routes were in operation on July 1, 1906 and 1907:

July 1.		July 1.	
1907.	1906.	1907.	1906.
Georgia..... 1,472	1,381	New York..... 1,771	1,722
Illinois..... 2,772	2,693	No. Carolina... 1,180	1,152
Indiana..... 2,113	2,105	Ohio..... 2,494	2,440
Iowa..... 2,318	2,266	Pennsylvania... 2,000	1,986
Kansas..... 1,628	1,566	Tennessee..... 1,544	1,534
Michigan..... 1,933	1,813	Texas..... 1,611	1,525
Minnesota..... 1,512	1,382	Wisconsin..... 1,543	1,450
Missouri..... 1,944	1,825		

Illinois has long been the banner State in the rural service, Ohio occupying second rank, closely followed by Iowa. Illinois easily holds the lead, having made a gain of 79 routes in 1907, as against 54 in Ohio and 52 in Iowa. The recently developed demand for the service in the South is significantly reflected in the large proportionate gains made in Texas and Missouri. It is suggestive that in both these States the mail order houses have conducted most active campaigns during the past year.

W. L. C.

J. H. SESSIONS & SON'S NEW PLANT.

J. H. SESSIONS & SON, Bristol, Conn., have moved to their new factory and are completing the installation of machinery from the two factories formerly occupied by them. The buildings, which are planned on the unit system, admitting of the extension of any unit as circumstances may require, are built of brick in the most substantial manner and comprise, in addition to the main buildings, which are three-story and basement and which contain the tool making and shipping departments, separate buildings for the plating department, the japanning department, for raw material storage and for power. The power plant consists of Otto gas engines and an R. D. Wood & Co. producer; the power being transmitted from the power house to the main buildings by means of a rope drive. A Babcock & Wilcox boiler furnishes the steam for heating the buildings, which is done by the blower system, and Stanley G. I. apparatus is used for the lighting plant. The floors in the plating and tinning, the japanning and engine rooms are of reinforced concrete, and in the plating and tinning rooms have been pitched to drains, preventing in a very great degree the accumulation of waste water and the consequent uncomfortable and unhealthful conditions. Special provision has been made for the comfort of employees; ample toilet facilities have been provided in every department, and the heating plant is so designed that a comfortable temperature will be maintained in the coldest weather.

The business was established in 1854 by J. H. Sessions, who was succeeded in 1872 by the partnership of J. H. Sessions & Son, and in 1905 by the present corporation, of which Albert L. Sessions, grandson of the founder, is president and treasurer. Trunk Hardware, Steel Stampings, Washers, Rivets, Burrs and Fellow Plates are manufactured, and the equipment consists principally of presses for blanking and forming sheet metal and facilities for finishing in various ways. The capacity has been considerably increased, not only by the installation of new machinery, but by the greater efficiency resulting from the more advantageous arrangement of equipment possible in the new buildings. A large stock of steel in a wide range of widths and thicknesses is constantly carried, admitting of the manufacture of many articles without the necessity of waiting for slow mill deliveries.

MISCELLANEOUS NOTES.

Enameled Ware.

Reed Mfg. Company, Newark, N. Y., and 104 Reade street, New York, in charge of Hiland Flowers, has recently put on the market the Silver Steel Enameled Ware, in a full line of cooking, kitchen and domestic utensils. In color this ware is white inside and out, with a sprinkling of black, giving a pepper and salt effect. A feature

of the ware is the four coats of enamel each piece receives and its guaranteed durability. It is supplementary to the line of four coated Flintstone enameled ware, guaranteed for 10 years. What the company claims for the Flintstone brand is that it will not scale under heat or hard usage. This line is also made in full assortments, the surface being principally black with white spots, and is strictly high grade.

Eclipse Cabinet Tank.

The R. E. Chapin Mfg. Works, Batavia, N. Y., are manufacturing a cabinet for gasoline or oil. The case is made of wood and the enclosed galvanized iron tank is furnished with a solid brass compression faucet and tight screw cap. The tank is designed particularly for gasoline, but is well adapted for safely storing turpentine, benzine, kerosene, or other oils. The cabinet is substantially built, nicely painted, fitted with hinged top covered with tin, so as to be storm proof, when placed out of doors. The front of the cabinet encloses the faucet and is provided with a hinged cover fitted with a lock and key. The tank rests on a shelf, leaving a compartment underneath for keeping measures, &c. When desired a pump, made in sections, is furnished, that can be stored with the measures. When the pump is joined together the length is such as to prevent pumping the contents of a barrel into the tank without raising the barrel from the ground. The tanks are made in 60 and 110 gal. capacities.

Philadelphia Ash, Garbage and Waste Can.

The Arrow Can Company, 35 Warren street, New York, is manufacturing the Philadelphia ash, garbage and waste can here shown. It is constructed of No. 20 gauge steel in bodies, No. 16 gauge steel for bottoms in

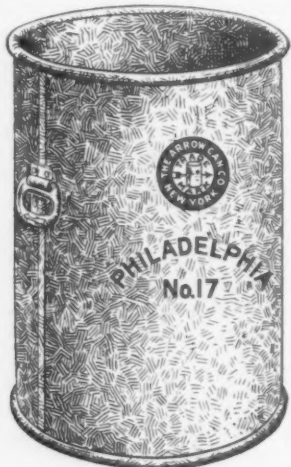


Fig. 1.—Philadelphia Ash, Garbage and Waste Can.

the black, galvanized after the parts are assembled, and can be soldered absolutely water tight, in addition, if so ordered. The cans have Arrow malleable iron handles and heavy handle clips, with four rivets each, as well as a $\frac{3}{8}$ -in. rod rolled in both top and bottom, giving a smooth finish inside. There are four sizes—No. 14, 14½



Fig. 2.—Self-Closing Waste Can Cover.

x 16½ in.; No. 15, 15 x 24 in.; No. 17, 17 x 24 in., and No. 19, 19 x 24 in. The cans are supplied with self-closing waste can covers, made of galvanized sheet iron, as seen in Fig. 2, so constructed that the cover remains closed when not in use. The cans may be had with or without covers.

Self-Locking Box Lock.

The accompanying cuts relate to a spring box lock, offered by the American Paper Cutter & Mfg. Company, Third and Spruce streets, St. Louis, Mo., as a rough and

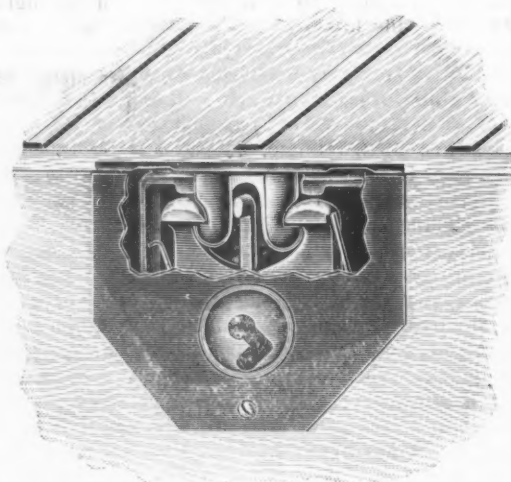


Fig. 1.—Self-Locking Box Lock.

ready lock. It is made entirely of malleable iron and steel, so that rough usage and exposure to weather will not injure it, and so that it can be closed with a slam without damage. It does away with the use of a hasp and can be unlocked with half a turn of the key. While

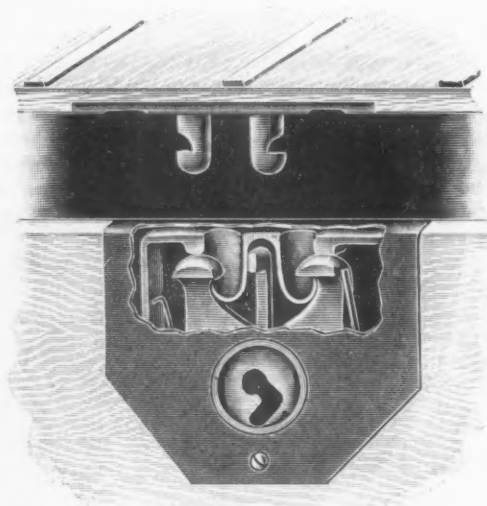


Fig. 2.—Self-Locking Lock Open.

the lock was originally designed for use on bakers' boxes in their delivery wagons, to be easily manipulated with chilled fingers in the dim light of dawn, it is also suitable for other uses such as contractors' and mechanics' boxes, farmers' feed bins, &c.

The Marlin Model No. 20 Rifle.

The Marlin Arms Company, New Haven, Conn., is offering the take-down 0.22 caliber repeating rifle, with trombone action, shown herewith. Short, long and long rifle cartridges, black and smokeless, including hunting cartridges with mushroom bullets, can be used in the rifle without any alteration or adjustment. The rifle has a solid top, side ejector, which throws the shells away from the shooter, and regular closed in Marlin frame. The point is made that the solid top does not catch rain or snow, that there is a wall of metal between the operator's head and the cartridge, preventing powder blow-

ing back in the face. The rifle has a tubular magazine and handles at one loading 15 short, 12 long or 11 long rifle cartridges. The cartridges may be loaded into the magazine all of one kind or mixed indiscriminately, and the rifle will handle them perfectly. It is stated that there is not a cheap piece of material in the entire rifle and that the workmanship is in every way of the highest quality. The rifle has an ivory bead front sight and a

blue finish. The entire length of the rifle is 39¼ in.; length taken down, 26 in., and weight about 4 lb. 2 oz.

Empire Steel Center Calk.

The Empire Steel Center Calk Company, 66 Reade street, New York, is putting on the market the self-sharpening calk shown in the accompanying cuts. It

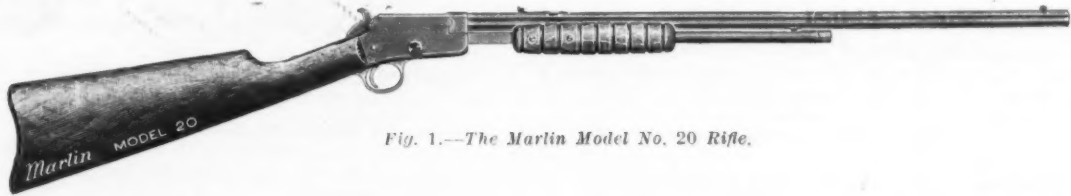


Fig. 1.—The Martin Model No. 20 Rifle.

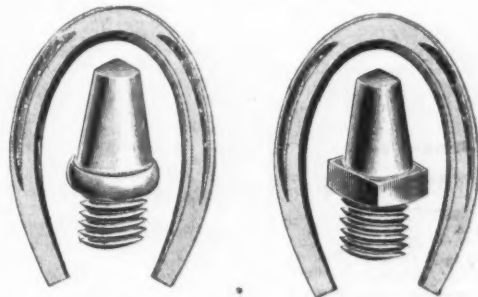
new improved adjustable rear sight, with a flat top that does not obstruct the view for quick shooting; also a vertical white line to assist the eye in getting the range quickly. The top of the frame and tang are drilled and tapped so that the company's receiver sight or a tang peep sight may be used if desired. The take-down principle, similar to the company's Model 1897, provides for



Fig. 2.—Martin No. 20 Rifle Taken Down.

wear, both laterally and vertically, so as to prevent the take-down joint becoming loose or shaky. As shown in Fig. 2 every action part is accessible for inspection and cleaning without tools, and the barrel may be cleaned by inserting the wiping rod at the breech and drawing it entirely through the barrel. The parts are all locked in place when the gun is taken down, so that they cannot drop out accidentally, but all parts may be removed in an instant without tools. The barrel is octagon, 22½ in. long, frame of best quality gun frame steel, blue finish; butt stock of black walnut, 13¼ in. long; drop at comb, 19-16 in.; drop at heel, 2¾ in.; steel butt plate,

has a rolled steel center all the way through from end to end, with a sort of jacket of softer metal, which wears more rapidly than the core, making the calk perpetually sharp. The manufacturer states that only the best material is used, and no labor or expense is spared to turn out the best possible product. The calks are suitable for



Round. Square.

Empire Steel Center Calks.

any character of work, they will fit any drilled shoe and are interchangeable with the tapping for all other calks. It is claimed that they will not wear loose. Sizes listed range from 5-16 to ¾ in., the same prices applying to either round or square pattern.

Mathis Hardware Company has partially closed out its stock in Alpaugh, Cal., and will move the remainder to Lindsay, Cal. Here it will open up a first-class store about August 15, including a complete line of Hardware, Farming Machinery, Paints, Oils, &c.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

Linseed, City, raw.....	45	@46
City, Boiled.....	46	@47
State and Western, raw.....	39	@40
Raw, Calcutta, in bbls.....	73	@74
Lard, Extra Prime, Winter.....	75	@77
Extra No. 1.....	73	@75
No. 1.....	49	@52
Cotton-seed, Crude, f.o.b. mills.....	49	@52
Summer Yellow, Prime.....	59	@61
Summer White.....	59	@61
Yellow Winter.....	59	@61
Sperm, Crude.....	50	@53
Natural Winter.....	72	@73
Bleached Winter.....	75	@76
Bleached Winter, Extra.....	75	@76
Tallow, Prime.....	63	@61
Whale, Crude.....	35	@36
Natural Winter.....	48	@49
Bleached Winter.....	50	@51
Extra Bleached Winter.....	52	@53
Menhaden, Brown, Strained.....	32	@33
Light Strained.....	32	@33
Northern.....	32	@33
Southern.....	32	@33
Cocanut, Ceylon.....	9	@9 1/2
Cochin.....	10	@10 1/2
Coal, Domestic, Prime.....	40	@42
Newfoundland.....	40	@42
Red, Elaine.....	47	@50
Saponified.....	7	@7 1/2
Olive, Italian, bbls, Yellow.....	66	@70
Neatsfoot, Prime.....	56	@57
Palm, Logos.....	7	@7 1/2

Mineral Oils—

Black, 29 gravity, 25@30 cold test.....	12 1/2	@13
29 gravity, 15 cold test.....	13	@13 1/2
Summer.....	12	@12 1/2
Condenser, light filtered.....	39	@42
Dark, filtered.....	14 1/2	@17 1/2
Paraffine, 903-907 gravity.....	14	@14 1/2
903 gravity.....	13	@13 1/2
903 gravity.....	10 1/2	@11 1/2
Red.....	13	@14 1/2

Miscellaneous—

Barytes:		
White, Foreign.....	1 ton	\$18.50@20.50
Amer. Roasted.....	1 ton	19.00@20.00
Off color.....	1 ton	13.00@15.50
Chalk, in bulk.....	1 ton	3.00@3.25
In bbls.....	100 lb	.35
China Clay, Imported.....	1 ton	11.00@17.50
Cobalt, Oxide.....	100 lb	2.50@2.60
Whiting, Commercial.....	100 lb	.43@.52
Gilders.....	100 lb	.55@.65
Ex. Gilders.....	100 lb	.60@.65
Putty, Commercial—	100 lb	
In bladders.....	\$1.70	@1.85
In bbls, or tubs.....	1.20	@1.45
In 1 lb to 5 lb cans.....	2.65	@2.95
In 12 1/2 to 50 lb cans.....	1.50	@1.90
Spirits Turpentine—	gal	
In bbls.....	58 1/2	@59
In machine bbls.....	59	@59 1/2
Glue—		
Cabinet.....	12	@15
Common Bone.....	7 1/2	@9
Extra White.....	18	@24
Foot Stock, White.....	12	@14
Foot Stock, Brown.....	9	@11
German Hide.....	12	@18
French.....	10	@40
Irish.....	13	@16
Low Grade.....	10	@12
Medium White.....	11	@17
Gum Shellac—		
Bleached, Commercial.....	44	@45
Bone Dry.....	53	@54
Button.....	40	@50
Diamond I.....	58	@59
Fine Orange.....	52	@57
A. C. Garnet.....	45	@46
Kala Button.....	35	@36
D. C.....	62	@63
Octagon B.....	56	@57
T. N.....	43	@45
V. S. O.....	58	@59
Colors in Oil—		
Black, Lampblack.....	12	@14
Blue, Chinese.....	36	@46
Blue, Prussian.....	32	@36

Blue, Ultramarine.....	13	@16
Brown, Vandyke.....	41	@44
Green, Chrome.....	12	@16
Green, Paris.....	12	@24
Sienna, Raw.....	12	@15
Sienna, Burnt.....	12	@15
Umber, Raw.....	11	@14
Umber, Burnt.....	11	@14

White Lead, Zinc, &c.—

Lead, English white, in Oil.....	10 1/2	@10 3/4
Lead, American White:		
Lots of 500 lb or over, in Oil.....	7 1/2	@8
Lots less than 500 lb, in Oil.....	8	@8
Lead, White, in oil, 25 lb tin		
pails, add to keg price.....	1 1/2	@1 1/2
Lead, White, in oil, 1 to 5 lb		
assorted tins, add to keg price.....	1 1/2	@1 1/2
Lead, American, Terms: For lots 12 tons and over 1/4¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.		
Zinc, American, dry.....	5 1/2	@5 1/2
Zinc, French:		
Antwerp, Red Seal, dry.....	8 1/2	@8 1/2
Antwerp, Green Seal, dry.....	10 1/2	@10 1/2
Paris, Red Seal, dry.....	9 1/2	@9 1/2
Paris, Green Seal, dry.....	11	@11
Zinc, V. M. French, in Poppy Oil:		
Green Seal:		
Lots of 1 ton and over.....	13 1/2	@13 1/2
Lots of less than 1 ton.....	13 1/2	@13 1/2
Zinc, V. M. French, in Poppy Oil:		
Red Seal:		
Lots of 1 ton and over.....	11 1/2	@12 1/2
Lots of less than 1 ton.....	12 1/2	@12 1/2
Discounts—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.		
Dry Colors—		
Black, Carbon.....	6 1/2	@10
Black Drop, American.....	3 1/2	@8
Black Drop, English.....	5	@15

Black, Ivory.....	16	@20
Lamp, commercial.....	4	@6
Blue, Celestial.....	4	@6
Blue, Chinese.....	30	@33
Blue, Prussian.....	28	@32
Blue, Ultramarine.....	3 1/2	@15
Brown, Spanish.....	1 1/2	@1
Carmine, No. 40.....	3 1/2	@3 1/2
Green, Chrome, ordinary.....	17	@25
Green, Chrome, pure.....	17	@25
Lead, Red, bbls, 1/2 bbls, kegs.....	7 1/2	@7 1/2
Litharge, bbls, 1/2 bbls, kegs.....	7 1/2	@7 1/2
Ocher, American.....	1 ton	\$8.50@16.00
American Golden.....	2 1/2	@3 1/4
French.....	1 1/2	@2
Foreign Golden.....	3	@4
Orange Mineral, English.....	10	@12
French.....	11 1/2	@12
German.....	10	@12
American.....	8 1/2	@9
Red, Indian, English.....	4 1/2	@5
American.....	5	@3 1/4
Red, Turkey, English.....	4	@10
Red, Tuscan, English.....	7	@17
Red, Venetian, Amer.....	100 lb	\$9.50@1.25
English.....	100 lb	\$1.15@1.63
Sienna, Italian, Burnt and Powdered.....	3	@9
Italian, Raw, Powdered.....	3	@7
American, Raw.....	1 1/2	@2
American Burnt and Pow'd.....	1 1/2	@2
Tale, French.....	1 ton	\$18.00@25.00
American.....	1 ton	15.00@25.00
Terra Alba, French.....	100 lb	.90@1.00
English.....	100 lb	.80@1.00
American.....	100 lb	.75@1.00
American.....	100 lb	.60@.65
Umber, T'key, Bnt. & Pow'd.....	2	@3 1/4
Turkey, Raw and Powdered.....	2 1/2	@3 1/2
Burnt, American.....	1 1/2	@2
Yellow, American.....	1 1/2	@2
Yellow Chrome, Pure.....	12	@14
Vermilion, American Lead.....	7	@25
Quicksilver, bulk.....	65	@65
Quicksilver, bags.....	65	@65
English, Imported.....	65	@70
Chinese.....	65	@70

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Price.—A range of prices is indicated by means of the symbol @. Thus 33½ @ 33½ & 10% signifies

that the price of the goods in question ranges from 33½ per cent. discount to 33½ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33½%
Norton's.....10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition.—See Caps, Cartridges, Shells, &c.

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ½ doz. pairs, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

Anvils—American—
Eagle Anvils.....½ lb. @ 8½¢
Hay-Budden, Wrought.....½ lb. @ 9½¢
Trenton.....½ lb. @ 9½¢

Imported—
Peter Wright & Sons, ½ lb. 64 to 349 lb. 11¢; 350 to 600 lb. 11½¢

Anvil, Vise and Drill—
Millers Falls Co., \$18.00.....15&10%

Apple Parers—See Parers, Apple, &c.

Aprons, Blacksmiths'—
Livingston Nail Co.....33½%

Augers and Bits—
Com. Double Spur.....70&10@75%
Jennings' Patn., reg. finish.....60&5@60&10

Black Lip or Blued—65&65¢
Boring Mach. Augers—70%
Car Bits, 12-in. twist—40&10%
Ford's Auger and Car Bits—40&5%
Ft. Washington Auger Co. Conard's—35%
Forstner Pat. Auger Bits—25%
C. E. Jennings & Co.—25%
No. 10 ext. lip, R. Jennings' list—25&7½%
No. 30, R. Jennings' list—50%
Russell Jennings—25&10&2½%
L'Hommedieu Car Bits—15%
Mayhew's Countersink Bits—25%
Pugh's Black—35%
Pugh's Jennings' Pattern—35%
Snell's Auger Bits—60%
Snell's Bell Hangers' Bits—60%
Snell's Car Bits, 12-in. twist—60%
Snell's King Auger Bits—50%
Wright's Jennings' Bits—50%

Bit Stock Drills—
See Drills, Twist.

Expansive Bits—
Clark's Pattern, No. 1, ½ doz. 25¢; No. 2, 18¢
Ford's, Clark's Pattern.....60&10%
C. E. Jennings & Co., Steel's Patn.....65%
Larigue Patn., small size, \$18.00; large size, \$26.00.....60&10%
Swan's.....60%

Gimlet Bits—Per gro.
Common Dble. Cut.....\$3.00@3.25
German Pattern, Nos. 1 to 10, \$4.75; 11 to 15, \$5.75

Hollow Augers—
Bonney Pat., per doz. \$6.50@7.00
Ames.....25&10%
Universal.....20%

Ship Augers and Bits—
Ship Augers.....40&10%
Ford's.....33&5%
C. E. Jennings & Co.:
L'Hommedieu's.....6%
Watrous'.....33½%
Snell's.....40%

Awl Hatts—See Handles, Mechanics' Tool.

Awls—
Brad Awls.....gro. \$2.75@3.00
Unhdd, Shldered.....gro. 65¢@70¢
Unhdded, Patent.....gro. 60¢@70¢
Peg Awls:
Unhdded, Patent.....gro. 31¢@34¢
Unhdd, Shldered.....gro. 65¢@70¢
Scratch Awls:
Handled, Com.....gro. \$3.50@4.00
Handled, Socket.....gro. \$11.50@12.00

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—
Single Bit, base weights: Per doz.
First Quality.....\$1.75@5.00
Second Quality.....\$1.25@4.50

Double Bit, base weights:
First Quality.....\$1.00@7.50
Second Quality.....\$6.50@6.75

Axle Grease—

See Grease, Axle

Axles—Iron or Steel
Concord, Loose Collar.....4½¢
Concord, Solid Collar.....4½¢
No. 1 Common, Loose.....3½¢
No. 1½ Com., New Styles.....4½¢
No. 2 Solid Collar.....3½¢
Half Patent:
Nos. 7, 8, 11 and 12.....70¢@75%
Nos. 13 to 14.....70¢@75%
Nos. 15 to 18.....75¢@75¢
Nos. 19 to 22.....75¢@75¢

Boxes, Axle—

Common and Concord, not turned lb., 4½¢
Common and Concord, turned lb., 5½¢
Half Patent.....lb., 9½¢@10¢

Bait—Fishing—
Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—Sash—
Caldwell new list.....50%
Pullman.....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....50&50&10%
Straight Balances.....10&40&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See Wire, Barb.

Bars—Crow—
Steel Crowbars, 10 to 40 lb. per lb., 2½¢ @ 3¢

Towel—

No. 10 Ideal, Nickel Plate.....gro. \$8.50

Beams, Scale—
Scale Beams.....40%
Chatillon's No. 1.....30%
Chatillon's No. 2.....40%

Beaters, Carpet—
Holt-Lyon Co.:
No. 12 Wire Coppered ½ doz. \$0.80; Tinned.....\$0.85
No. 11 Wire Coppered ½ doz. \$1.15; Tinned.....\$1.20
No. 10 Wire Tinned.....½ doz. \$1.50

Beaters, Egg—
Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, \$0.80; No. A, Jap'd, \$1.15; No. B, Jap'd, \$1.85; No. 6, Jap'd, \$1.65, Lyon, Jap'd, per doz., No. 2, \$1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, \$6.00; No. 75, \$6.50; No. 100, \$7.00; No. 102, Tin'd, \$8.50; No. 150, Hotel, \$15.00; No. 152, Hotel Tin'd, \$17.00; No. 200, Tumbler, \$8.50; No. 202, Tumbler Tin'd, \$9.50; No. 300, Mammoth, per doz., \$25.00.
Tanner & Seymour Mfg. Co.:
T. & S. Dover.....\$6.50

Bellows—
Blacksmith, Standard List.
Split Leather.....60¢@10¢
Grain Leather.....50¢@50¢

Hand—

Inch.....6 8 9 10
Doz.....\$5.00 5.50 6.00 6.50 7.50

Molders—
Inch.....10 12 14 16
Doz.....\$7.50 9.00 12.00 15.00

Bells—Cow—
Ordinary Goods.....75¢@75¢
High grade.....70¢@75¢
Jersey.....75¢@10%
Texas Star.....50%

Door—
Home, B. & E. Mfg. Co.'s.....35&10%

Hand—

Polished, Brass.....50¢@50¢
White Metal.....50¢@50¢
Nickel Plated.....40¢@10¢
Swiss.....50¢@10¢
Cone's Globe Hand Bells.....33½¢@35%

Miscellaneous—

Farm Bells.....lb., 2¼¢@2½¢
Church and School.....60¢@60¢

Belting—Leather—
Extra Heavy, Short Lap.....60¢@65%
Regular Short Lap.....60¢@10¢
Standard.....70¢@5%
Light Standard.....75%
Cut Leather Lacing.....40¢@5%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—

Agricultural (Low Grade).....75¢@75¢
Common Standard.....70¢@70¢
Standard.....70¢@70¢
Extra.....60¢@60¢
High Grade.....50¢@50¢

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire—
Green River Tire Benders and Upsetters.....20%

Bicycle Goods—
John S. Leng's Son & Co.'s 1907 list:
Chain, Parts, Spokes.....50%
Tubes.....60%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

Blocks—Tackle—
Common Wooden.....75%
B. & C. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior.....30%
See also Machines, Hoisting.

Boards, Stove—
Paper and Wood Lined.....40%
Embossed.....50%

Boards, Wash—See Washboards.

Bobs, Plumb—
Keuffel & Esser Co.....33½%

Bolts—
Carriage, Machine, &c.—
Common Carriage (cut thread):
¾ × 6 and smaller.....70¢@10%
Larger and Longer.....60¢@2½¢
Phila. Eagle, \$5.00 list May 21, '09 90%

Bolt Ends.....65¢@65¢
Machine (cut thread):
¾ × 4 and smaller.....70¢@7½¢
Larger and longer.....60¢@7½¢

Door and Shutter—
Cast Iron Barrel, Japanned,
Round Brass Knob:
Inch.....3 4 5 6 8
Per doz. \$0.30 .35 .45 .60 .80
Cast Iron Spring Foot, Jap'd:
Inch.....6 8 10
Per doz.....\$1.20 1.50 2.25
Cast Iron Chain, Flat, Japanned:
Inch.....6 8 10
Per doz.....\$1.00 1.40 1.65
Cast Iron Flat Shutter, Jap'd,
Brass Knobs:
Inch.....6 8 10
Per doz.....\$0.75 .95 1.25
Wrought Barrel Jap'd.....80¢@80¢
Barrel Bronzed.....60¢@10%
Spring.....70¢@10¢
Shutter.....50¢@50¢
Square Neck.....75¢@75¢
Square.....70¢@10¢
Ives' Patent Door.....35%
Ives' Wrought Metal.....45%

Expansion—

Richards Mfg. Co.....50&10%

Plow and Stove—

Plow.....65¢@—%
Stove.....85¢@55¢

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '94.....80%
Eagle Phila., list Oct. 16, '94.....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '94.....80%
Eagle Phila., list Oct. 16, '94.....82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '94.....80%
Eagle.....82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99.....80%
Phila. Eagle, list Oct. 16, 1884.....82½%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Bung—
Borers Bung, Ring, with Handle:
Inch.....1¼ 1½ 1¾ 2
Per doz.....\$1.80 5.60 6.40 8.00
Inch.....2¼ 2½ 2¾ 3
Per doz.....\$5.65 11.50
Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.50 each.....25%

Boxes, Mite—
C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Impr'ed, 20&10%; Langdon Acme.....15&10%
Perfection.....40%
Seavey.....45%

Hendryx Bronze; Series 700, 800, 300.
Hendryx Enamelled.....35

Calipers—See Compasses.**Calks, Toe and Heel—**

Blunt, 1 prong, per lb. 4 1/4 @ 4 3/4
Sharp, 1 prong, per lb. 4 3/4 @ 5 1/4
Burke's, Blunt, 4 @ 4 3/4; Sharp, 4 @ 5 1/4
Lautier, Blunt, 4 @ 4 3/4; Sharp, 4 @ 5 1/4
Perkins', Blunt, 4 @ 3 5/8; Sharp, 4 @ 4 1/8

Can Openers—

See Openers, Can.

Caps, Percussion—

Eley's E. B. 50 @ 55¢
G. D. per M 34 @ 35¢
F. L. per M 40 @ 42¢
G. E. per M 48 @ 50¢
Musket per M 68 @ 63¢

Primers—

Berdan Primers, \$2 per M. 20¢
Primer Shells and Bullets. 15¢
All other primers per M. \$1.52 @ 1.60

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

Blank Cartridges:
32 O. F., \$5.50.....10¢
38 O. F., \$7.00.....10¢
22 cal. Rim., \$1.50.....10¢
32 cal. Rim., \$2.75.....10¢
B. B. Caps, Can. Bull. Siedg. \$1.50
B. B. Caps, Round Bull. \$1.40
Central Fire, 85¢
Target and Sporting Rifle. 15¢
Primer Shells and Bullets. 15¢
Rim Fire, Sporting.....50¢
Rim Fire, Military.....15¢

Casters—

Bed 65¢
Plate 10¢
Philadelphia 70¢
Acme, Ball Bearing.....30¢
Gem (Roller Bearing).....70¢
Steel Gem.....20¢
Standard Ball Bearing.....40¢
Yale (Double Wheel) low list. 40¢

Cattle Leaders—

See Leaders, Cattle.

Chain, Proof Coil—

American Coil, Straight Link:
3-16 1/4 5-16 3/4 7-16 1/2 9-16
\$8.77 6.17 5.02 4.57 4.27 4.22
6-2 3/4 7/8 to 1 1/4 to 1 1/2 inch.
\$4.17 4.07 4.02 4.12
In case lots, deduct 25¢.
German Coil.....60¢

Halter—

Halter Chains.....60¢
German Pattern Halter Chains
List July 24, 97.....60¢
Covert Mfg. Co. 35¢

Cow Ties—

See Halters and Ties.

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6 1/4-6-3, Straight, with ring. \$28.00
6 1/4-6-2, Straight, with ring. \$29.00
6 1/4-8-2, Straight, with ring. \$32.00
6 1/4-10-2, Straight, with ring. \$37.00

NOTE.—Add 2c per pair for Hooks.
Twist Traces: add per pair for Nos. 2 and 3, 2c; No. 1, 1c; No. 4, to price of Straight Link.

Eastern Standard Traces, Wag-
on Chain, &c.....60¢

Miscellaneous—

Jack Chain, list July 10, '93.
Iron 60¢
Brass 50¢
Safety and Plumbers' Chain,
..... 60¢
Gal. Pump Chain.....10¢
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stal-
lion 40¢
Oneida Community:
American Halter, Dog and Kennel
Chains 35¢
Niagara Dog Leads and Kennel
Chains 45¢
Wire Goods Co.:
Dog Chain.....70¢
Universal Intl. Jointed Chain.....50¢

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain.....60¢
Pullman:
Bronze Chain, 80%; Steel Chain,
..... 60¢
Sash Chain Attachments, per set. 8¢
Aluminum Sash Ribbon, per 100
ft. \$1.25 @ \$3.00
Sash Ribbon Attachments, per set. 8¢

Chalk—(From Jobbers.)

Carpenters' Blue.....50¢
Carpenters' Red.....45¢
Carpenters' White.....40¢

Checks, Door—

Hardy's 45¢
Pullman, per 670 \$54.00
Russwin 33¢

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....50¢
Youths' Chests, with Tools.....35¢
Gentlemen's Chests, with Tools.....25¢
Farmers', Carpenters', etc., Chests,
with Tools.....20¢
Machinists' and Pipe Fitters'
Chests, Empty.....15¢
Tool Cabinets.....15¢
C. E. Jennings & Co.'s Machinists'
Tool Chests.....75¢

Chisels—

Socket Framing and Firmer
Standard List.....70¢
Buck Bros.....30¢
C. E. Jennings & Co.:
Socket Firmer No. 10.....25¢
Socket Framing No. 15.....25¢
Swain's.....60¢
L. & I. J. White Co.....30¢

Tanged—

Tanged Firmers.....30¢
Buck Bros.....30¢
C. E. Jennings & Co. Nos. 191, 181, 257
L. & I. J. White Co.....35¢

Cold—

Cold Chisels, good quality. 15¢
Cold Chisels, fair quality. 11¢
Cold Chisels, ordinary... 9¢

Chucks—

Almond Drill Chucks.....35¢
Almond Turret Six-Tool Chuck.....40¢
Beach Pat., each \$8.00.....35¢
Empire.....25¢
Blacksmiths.....25¢
Jacobs' Drill Chucks.....35¢
Pratt's Positive Drive.....25¢
Skinner Patent Chucks:
Independent Lathe Chucks.....35¢
Universal, Reversible Jaws.....35¢
Combination, Reversible Jaws.....35¢
Drill Chucks, New Model, 25¢
Standard, 15¢; Skinner Pat.,
25¢; Positive Drive.....40¢
Planer Chucks.....20¢
Face Plate Jaws.....35¢
Standard Tool Co.:
Improved Drill Chuck.....45¢
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6,
7, 8 and 17, 40¢; No. 21.....35¢
Scroll Combination, Nos. 83 and
84.....30¢
Geared Scroll, Nos. 33, 34 and 318, 25¢
Independent Iron, Nos. 18 and 318, 25¢
Independent Steel, No. 64.....25¢
Union Drill, Nos. 600, 60, 100, 101,
102, 103, 104.....35¢
Union Czar Drill.....25¢
Universal, 11, 12, 16, 17, 13, 11, 15, 40¢
Universal, No. 42.....35¢
Iron Face Plate Jaws, Nos. 28, 30,
48 and 50.....35¢
Steel Face Plate Jaws, Nos. 70 and
72.....35¢
Westcott Patent Chucks:
Little Giant Auxiliary Drill.....50¢
Little Giant Double Grip Drill.....50¢
Little Giant Drill, Improved.....50¢
Oneida Drill.....50¢
Scroll Combination Lathe.....50¢

Clamps—

Adjustable, Hammers.....20¢
Carriage Makers, P. S. & W.
Co. 50¢
Besly, Parallel.....35¢
Myers' Hay Rack.....10¢
Lineman's Swedish Neverturn.....60¢
Wood Workers, Hammers.....40¢
Saw Clamps, see Vises, Saw Filers.

Cleaners, Drain—

Iwan's Champion, Adjustable.....50¢
Iwan's Champion, Stationary.....40¢

Sidewalk—

Star Socket, All Steel.....40¢
Star Shank, All Steel.....32¢
W. & C. Shank, All Steel.....40¢
7 1/4 in. \$3.00; 8 in. \$3.25.

Cleavers, Butchers—

Foster Bros.....30¢
Fayette R. Plumb.....30¢
L. & I. J. White Co.....30¢

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each. \$10.75
20th Century Horse, each. \$5.00
Lightning Belt Horse, each. \$15.00
Chicago Belt Horse, each. \$20.00
Stewart's Enclosed Gear
Horse, each.....\$7.75
Stewart's Patent Sheep Shear-
ing Machine, each.....\$12.75
Stewart Enclosed Gear Shear-
ing Machine, No. 8, each. \$9.75

Clips, Axle—

Regular Styles, list July 1, '05.
..... 80¢

Cloth and Netting, Wire

—See Wire, &c.

Cocks, Brass—

Hardware List:
Plain Bibbs, Globe, Kerosene,
Racking, Liquor, Bottling,
&c. 60¢
Compression Bibbs.....55¢

Coffee Mills—

See Mills, Coffee.

Collars, Dog—

Nickel Chain, Walter B. Stevens &
Son's list.....40¢
Leather, Walter B. Stevens & Son's
list.....40¢

Compasses, Dividers, &c.

Ordinary Goods.....70¢
Wm. Schollhorn Co.:
Excelsior Dividers.....60¢
Lodi Dividers.....70¢

Conductor Pipe—

L. C. L. to Dealers:
Galv. Charcoal Copper.
Steel. Iron. 1 1/2, 1 3/4, 2 oz.
Eastern:
70% 50¢
Central:
65% 55¢
Western and Southern:
65% 50¢
So. Western:
50% 50¢
Terms, 60 days; 2% cash 10 days. Fac-
tory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:
Gal.....2 3 4 6 8
Galvanized, ea. \$1.85 \$2.00 \$2.25 \$2.90 \$3.90
Galvanized, Lined, side handles,
Gal.....2 3 4 6 8
Each\$1.95 \$2.15 \$2.40 \$3.30 \$4.15
White Enamelled.....10¢
Agate Lined.....10¢

Coopers' Tools—

See Tools, Coopers'.

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair
and heavier, 50¢ @ 33¢; lighter
than 3 lb. to pair.....32¢

Cord— Sash—

Braided, Drab.....1b. 35¢
Braided, White, Com., Nos. 8
to 12, 26¢; No. 7, 26 1/4¢; No. 6,
27 1/2¢.
Cable Laid Italian, lb. No. 18, 37¢
Italian, lb. A, No. 18, 25¢; B, 22¢
Common India, lb. No. 11, 11 1/4¢
Patent Sash Cord, Twisted, 18 @ 20¢
Patent Russia.....1b. 20¢
Cable Laid Russia.....1b. 21¢
India Hemp, Br'd'd.....1b. 21¢
India Hemp, Twisted.....1b. 13 1/4¢
Patent India, Twisted.....1b. 17¢
Pearl Braided cotton, No. 6, 1b. 1b
27 1/4¢; No. 7, 26 1/4¢; Nos. 8 to 12, 26¢
Eddystone, Braided, Nos. 8 to 12,
26¢; 7, 26 1/4¢; 6, 27 1/4¢.
Harmony Cable Laid Italian, Nos. 7
to 10.....1b. 23¢
Pullman:
Wire Sash Cord.....10¢
Sash Cord Attachments, per doz. 10¢
Samson, Nos. 8 to 12:
Braided, 1b. Drab Cotton,
55¢; Italian Hemp, 40¢ @
50¢; Linen, 65¢; White Cot-
ton, 50¢; Spot Cord.....50¢
Massachusetts, White.....40¢
Massachusetts, Drab.....45¢
Phoenix, White, Nos. 8 to 12, 27¢
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢;
B, Drab, 40¢; B, White, 35¢;
Italian Hemp, 40¢; Linen.....57¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906. 85¢ @ 10¢
Hendryx Standard Wire Picture Cord,
old list. 85¢
Turner & Stanton Co. Wire Picture
Cord.....85¢

Cradles—

Grain.....40¢

Crayons—

White Round Crayons, Cases, 100
gro., \$6.50 @ \$7.50 at factory, but
lower prices made by jobbers
Zelnicke's Lumber.....\$7.50
White and Purple, Indelible.....\$7.50
Blue, Red, Green, Yellow and
Terra Cotta, \$6.50; Black.....\$4.00
Giant Lumber, 5 1/4 in. x 15-16 in.
round, all colors, \$16.25; Indel-
ible.....\$18.75
Genuine Soapstone, Metal Workers',
5 in. x 3/4 in. Round, \$2.50; 5 in. x
3/4 in. Square, \$1.75; 5 x 1 1/2 x 3-16
\$2.50; 5 x 1 1/2 x 3-16.....\$3.00

Crooks, Shepherds—

Fort Madison, per doz., Heavy, \$5.50;
Light.....\$5.00

Crow Bars—See Bars, Crow.**Cultivators—**

Victor Garden.....50¢

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, 30 doz. \$3.50
Star, Eagle, Rogers & Hamilton
and Anchor.....30 doz. \$3.00
Wm. Rogers & Son.....30 doz. \$2.50

Cutters— Glass—

H. H. Mayhew Co.....40¢
Red Devil.....60¢
B. Mfg. Co.....40¢
Woodward.....50¢

Meat and Food—

American.....30¢
Nos. 401 402 403 404 405 406 407
Each\$5 \$7 \$10 \$12 \$25 \$50 \$60
Enterprise:
Nos. 5 10 12 22 32
Each\$2 \$3 \$2.75 \$1.50 \$6 \$25 @ 75¢
No. 202, \$1.50.....40¢
P. S. & W. Co.:
Dixon's.....30 doz. 33 1/2¢
Nos. 1 2 3 4
Ideal\$11.00 \$17.00 \$19.00 \$30.00
Hales.....40¢
Little Giant.....40¢
Nos. 305 310 312 320 322
Each\$35.00 \$48.00 \$44.00 \$72.00 \$68.00
New Triumph No. 606, 30 doz. \$24.00,
40¢
Russwin Food, No. 1, \$24.00; No. 2,
\$27.00.....45¢
Enterprise Beef Shavers.....25¢

Slaw and Kraut—

Henry Diston & Sons:
Slaw and Kraut Cutters.....35¢
Corn Graters.....30¢
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife.....30¢
Combined Slaw Cutter and Corn
Grater.....30¢

Tobacco—

All Iron, Cheap.....doz. \$1.25 @ \$1.50
Enterprise.....25¢
National, 30 doz., No. 1, \$21; No. 2,
\$18.....40¢

Diggers, Post Hole, &c.—

Diston's:
Rapid, 30 doz., \$24.00.....25¢
Samson, 30 doz., \$34.00.....25¢
Iwan's Imp'd Post Hole Auger.....40¢
Vaughan Pattern Post Hole Augers
.....30¢
Perfection Post Hole Diggers, 30
doz.\$8.75
Split Handle Post Hole Diggers,
30 doz.\$7.75
Hercules Pattern, 30 doz.\$10.00
Kohler's, 30 doz., Universal, \$15.00;
Little Giant, \$12.00; Hercules,
\$10.00; Invinible, \$9.00; Rival,
\$8.50; Pioneer.....\$7.50
Never-Break Post Hole Diggers, 30
doz.\$6.00

Dividers—See Compasses.**Drawing Knives—**

See Knives, Drawing.

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers.....35¢
Sterling Wheel Dresser Cutters.....35¢

Drills and Drill Stocks—

Blacksmiths' Common Drilling
Machines.....\$1.50 @ \$1.75
Breast, Millers Falls.....10¢
Breast, P. S. & W.....33 1/2¢
Goodell Automatic Drills. 50¢ @ 60¢
Millers Falls Automatic Drills. 33¢ @ 40¢
Ratchet, Curtis & Curtis.....40¢
Ratchet, Parker's.....40¢
Ratchet, Weston's.....40¢
Ratchet, Weston's, Style H Im-
proved.....40¢
Ratchet, No. 012.....40¢
Ratchet, Celebrated.....40¢
Ratchet, Whitney's, P. S. & W.
.....50¢
Whitney's Hand Drill, No. 1, \$10.00;
Adjustable, No. 10, \$12.00.....33 1/2¢

Twist Drills—

Bit Stock.....60¢
Taper and Straight Shank.....60¢

Drivers, Screw—

Screw Driver Bits, per doz. 45¢ @ 50¢
Balsey's Screw Holder and Driver, 30
doz., 2 1/4 in., 40¢; 4 in., \$7.50; 6 in.,
.....50¢
Buck Bros' Screw Driver Bits.....30¢
Champion.....50¢
Diston's.....70¢
Edson.....60¢
Fray's Hol. H'dle Sets, No. 3, \$12.50;
Ford's Brace Screw Drivers.....40¢
Gay's Double Action Ratchet.....35¢
Goodell's Auto.....65¢
Mayhew's Black Handle.....40¢
Mayhew's Monarch.....40¢
Millers Falls, Nos. 20 and 21, 25¢
Millers Falls, Nos. 11, 12, 41, 42, 15¢
Smith & Hemenway Co. Never-
turn, 66%; Elmora, 60%; Star,
30¢
Swan's:
Nos. 7565 to 7568, 50%; No. 7540,
40¢

Eave Trough, Galvanized—

Territory. L. C. L. Galvanized
Galv. Charcoal Copper.
Steel. Iron. 1 1/2, 1 3/4, 2 oz.
Eastern:
70% 70% 30%
Central:
75¢ 65¢ 20¢
Western and Southern:
75¢ 65% 20¢
So. Western:
75% 60% 20¢

Terms, 2% for cash. Factory ship-
ments generally delivered.

See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. I.
Standard Gauge.....80¢
No. 26.....50¢
No. 24.....25¢
No. 22.....10¢
Copper.....40¢

Elbows, Stove Pipe—

Edwards, Standard Blue.....40¢
Edwards, Royal Blue.....40¢
Reeves, Dover, one piece.....40¢

Emery, Turkish—

4 to 5 1/2 to
46: 220: Flour.
Kegs.....1b. 5¢ 5 1/4¢ 5 1/2¢
1 1/2 Kegs.....1b. 5 1/4¢ 5 1/4¢ 5 1/4¢
1 1/4 Kegs.....1b. 5 1/4¢ 5 1/4¢ 5 1/4¢
10 lb. cans.
10 in case.....6 1/4¢ 7 1/4¢ 8 1/4¢
10 lb. cans, less
than 10.....10¢ 10¢ 10¢
Less quantity. 10¢ 10¢ 10¢

NOTE.—In lots 1 to 3 tons a discount
of 10% is given.

D. & H. Seovil.....30%
Am. Fork & Hoe Co. (Seovil Pat-
tern).....60%

Handled—

NOTE—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding, No. 1, \$2.00; No. 2, \$2.50
Star Double Bit.....\$3.20
Ft. Madison Cotton Hoe.....70¢@10¢
Ft. Madison Crescent Cultivator Hoe.....70¢@10¢
Ft. Madison Mattock Hoe.....70¢@10¢
Regular Weight.....\$4.00
Junior Size.....\$4.00
Ft. Madison Sprouting Hoe, \$4 doz., 60¢@10¢
Ft. Madison Dixie Tobacco Hoe.....75¢@10¢
Kretzinger's Cut Easy.....70¢@10¢
Warren Hoe.....75¢@10¢
A & T. Iron Hoe.....75¢@10¢
B. B. 6 in. Cultivator Hoe.....\$3.40
B. B. 6 in. in.....\$3.50
Yankee Weeding.....\$4 doz., net, \$1.35
W. & C. L'ning Shuffler Hoe, \$4 doz., \$5.25

Hoisting Apparatus—
See *Machines, Hoisting.***Holders—Bit—**

Angular, \$4 doz. \$24.00.....45¢@10¢

Door—

Bardsley's, Iron, 40%; Brass and Bronze.....25¢
Empire.....50¢
Pullman.....35¢
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip.....50¢
Superior.....35%

File and Tool—

Nicholson File Holders and File Handles.....35¢@40%

Fruit Jar—

Triumph Fruit Jar Holder, \$9 gross, \$10.80; \$4 doz. \$1.25

Trace and Rein—

Fernald Double Trace Holder, \$4 doz. pairs.....\$1.25
Dash Rein Holder, \$4 doz. pairs, \$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swat, 50%; German.....35%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Coat and Hat, Reading.....45¢@20¢
Coat and Hat, Wrightsville.....60¢@5¢
Harness, Reading List.....40%

Wire—

Belt.....80%
Wire C. & H. Hooks.....70¢@10¢
Bradley Metal Clasp Wire, Coat and Hat, 70¢@10¢; Ceiling.....70¢@10¢
Columbian Hdw. Co., Gem.....70¢@10¢
Parker Wire Goods Co., King.....70¢@10¢
Wire Goods Co.:
Acme, 60¢@10¢; Chief, 70%; Crown, 75%;
Clear, 65%; V. Brace, 75%;
Clear Harness, 50¢@10¢

Wrought Iron—

Box, 6 in., per doz., \$1.00; 8 in., \$1.25; 10 in., \$1.50.

Cotton.....doz. \$1.05@1.25

Wrought Staples, Hooks, &c.—See Wrought Goods

Miscellaneous—

Hooks, Bench, See *Stops, Bench.*
Bush, Light, doz., \$6.20; Medium, \$6.75; Heavy, \$7.65
Grass, best, all sizes, per doz. \$3.00
Grass, common grades, all sizes, per doz.....\$1.75
Whiffletree.....lb. 5¢@6¢
Hooks and Eyes:
Brass.....60¢@10¢
Malleable Iron.....70¢@10¢
Covers, Mfg. Co. Gate and Scuttle Hooks.....40%
Ft. Madison Cut-Easy Corn Hooks, \$4 doz., \$3.25 net
Turner & Stanton Co. Cup and Shoulder.....80¢@10¢
Bench L. Co.—See *Back Stops.*
Corn Hook—See *Keltes, Corn.*

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, 3/4-in.:
Competition.....ft. 5 @ 6¢
3-ply Guaranteed.....ft. 8 @ 9¢
4-ply Guaranteed.....ft. 10 @ 11¢
Cotton Garden, 3/4-in., coupled:
Low Grade.....ft. 8 @ 9¢
Fair Quality.....ft. 10 @ 11¢

Irons—Sad—

From \$4 to 10.....lb. 3¢@1¢
B. B. Sad Irons.....lb. 3¢@1¢
Mrs. Potts', cents per set:
No. 50 55 60 65
Jap'd Tops.....83 80 93 91
Tin'd Tops.....88 85 98 95
New England Pressing.....lb. 3¢@1¢

Bar and Corner—

Richards Mfg. Co., Bar, 60¢@10¢; Corner.....60%

Pinking—

Pinking Irons.....dos. 60¢

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30¢@2¢; Steel, 45%
Lockport.....50%

Lane's Steel.....50¢@5¢
Richards' Flat Steel, No. 130.....50¢@10¢
Smith & Hemenway Co.'s.....25%

Ladder—

Richards Mfg. Co., Ladder Jacks.....50%

Kettles—

Brass, spun, Plain.....80¢@25¢
Enameled and Cast Iron—See *Ware, Hollow.*

Knives—**Butcher, Kitchen, &c.—**

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....50%

Wilmington Acme, \$4 doz., \$2.65; Dent, \$2.75; Adj. Serrated, \$2.20; Serrated, \$2.10; Yankee No. 1, \$1.50; Yankee No. 2, \$1.15

Drawing—

Standard List.....75¢@5¢@10¢
C. E. Jennings & Co., Nos. 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

Hay and Straw—

Serrated Edge, per doz. \$5.50@5.75

Iwan's Sickle Edge.....\$4 doz. \$9.50

Iwan's Serrated.....\$4 doz. \$10.00

Mining—

Buffalo.....\$9 gro. \$13.00

Miscellaneous—

Farmers'.....doz. \$3.00@3.25

Westenholm's.....\$4 doz. \$3.00@3.25

Knobs—

Base, 2 1/2-inch, Birch, or Maple, Rubber Tip.....\$1.25@1.40

Carriage, Jap., all sizes.....gro. \$4@4.5¢

Door, Mineral.....doz. 65¢@70¢

Door, Por. Jap'd.....doz. 70¢@75¢

Door, Por. Nickel.....doz. \$2.05@2.15

Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—

See *Beltting, Leather.*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable.....50%

Lau's Store.....30%

Myers' Noiseless Store Ladders.....45%

Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladies, Melting—

L. & G. Mfg. Co. (low list).....20%

P. S. & W.....40¢@10¢

Reading.....50%

Lanterns—Tubular—

Regular, No. 0.....doz. \$4.35@4.50

Side Lift, No. 0.....doz. \$4.60@4.75

Hinge Globe, No. 0.....doz. \$4.60@4.75

Other Styles.....\$4.00@4.50

Bull's Eye Police—

3-inch.....\$4.25@4.50

Latches—Thumb—

Roggin's Latches, with screw.....doz. 35¢@40¢

Door—

Allith Mfg. Co., Reliable and Allegator, 50%; Reliable Cold Storage, 50%
Cronk & Carrier Mfg. Co., No. 101, \$4 doz. \$2.30

Richards' Bull Dog, Heavy, No. 125.....50¢@5¢

Richards' Trump, No. 127.....\$1.50

Leaders, Cattle—

Small.....doz. 50¢; large, 60¢

Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%;
Sisal, 20%

Leathers, Pump—

See *Pumps.*

Lifters, Transom—

R. & E.....10%

Lines—

Wire Clothes, Nos. 18 19 20

104 feet.....\$2.50 2.25 2.00

75 feet.....\$1.75 1.35 1.10

Edmon Cordage Works:
Solid Braided Chalk, Nos. 0 to 3, 40%
Solid Braided Mason's, No. 0, 30%
Silver Lake Braided Chalk, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50

Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3 1/2, \$1.50; No. 4, \$2.00; No. 4 1/2, \$2.50; Colored, No. 3 1/2, \$1.75; No. 4, \$2.25; No. 4 1/2, \$2.75

Linen, No. 3 1/2, \$2.50; No. 4, \$3.50; No. 4 1/2, \$4.50

Tent and Awning Lines: No. 5, White Cotton, \$7.50; Drab Cotton, \$8.50

Clothes Lines White Cotton: 60 ft., \$2.75; 60 ft., \$3.25; 70 ft., \$3.75; 75 ft., \$4.00; 80 ft., \$4.25; 90 ft., \$4.75; 100 ft., \$5.25

Turner & Stanton Co.:
Solid Braided Chalk, Mason's and Awning Lines.....40%
Clothes Lines, White Cotton.....20%
Shade Cord, Cotton or Linen.....20%

Locks—Cabinet—

Cabinet Locks.....25%
Door Locks, Latches, &c.—
NOTE—Net Prices are very often made on these goods.

Reading Hardware Co.....40%

R. & E. Mfg. Co.....10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass.....75¢@10¢

Sash, &c.—

Ives' Patent:
Bronze and Brass, 55¢@5¢; Crescent, 60%; Iron, 60%; Window Ventilating, 40¢@20¢; Robinson Pat. Ventilating Sash Lock, 33%

Pullman Patent Ventilating Lock, 35%
Reading.....40%

Machines—Boring—

Com. Up'r, without Augers.....\$2.00

Pinking Irons—

See Irons, Pinking.

Pins, Escutcheon—

Brass 50¢ @ 50¢ 10%
 Iron, list Nov. 11, '85... 60¢ @ 60¢ 10%

Pipe, Cast Iron Soil—

Standard, 2-6 in. 50%
 Extra Heavy, 2-6 in. 60%
 Fittings, Stand. and Hvy. 70%

Pipe, Merchant—

Consumers, Carloads.

Steel. Iron.

Blk. Galv. Hk. Galv.

	%	%	%	%
2 1/2 to 3 in.	64	48	57	41
3 1/2 in.	66	52	59	47
4 1/2 in.	68	56	61	49
5 1/2 to 6 in.	72	62	66	56
7 to 12 in.	69	61	61	46

Pipe, Vitrified Sewer—

Carload lots.

Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
 First-class 82%
 Second-class 85%

NOTE.—Market irregular.

Pipe, Stove—

Per 100 joints.
 Edwards' Nested: C. L. L. C. L.
 5 in., Standard Blue... \$6.25 \$7.25
 6 in., Standard Blue... 6.75 7.75
 7 in., Standard Blue... 7.25 8.25
 8 in., Royal Blue... 7.50 8.50
 9 in., Royal Blue... 8.00 9.00
 10 in., Royal Blue... 8.50 9.50
 Wheeling Corrugating Co.'s Nested:
 5 in., Uniform Color... \$6.15 \$7.15
 6 in., Uniform Color... 6.65 7.65
 7 in., Uniform Color... 7.15 8.15

Planes and Plane Irons—**Wood Planes—**

Bench, first qual. 30¢ @ 30¢ 10%
 Bench, second qual. 40¢ @ 40¢ 10%
 Molding 25¢ @ 25¢ 10%
 Chapin-Stephens Co.:
 Bench, First Quality 30%
 Bench, Second Quality 40%
 Molding and Miscellaneous 25%
 Toy and German 30%
 Union 60%

Iron Planes—

Chaplin's Iron Planes 50¢ 10%
 Union 60%

Plane Irons—

Wood Bench Plane Irons, list
 Dec. 12, '06 25%
 Buck Bros. 30%
 Chapin-Stephens Co. 25%
 Union 50%
 L. & J. White 20¢ 25%

Planters, Corn, Hand—

Kohler's Eclipse 30¢ doz. \$8.00

Plates—

Feloe 1 lb. 4¢ @ 4 1/4¢

Pliers and Nippers—

Button Pliers 75¢ @ 75¢ 10%
 Gas Burner, per doz., 6 in., \$1.25
 @ \$1.30, 6 in., \$1.45 @ \$1.50.
 Gas Pipe, 7 8 10 12 in.
 \$2.00 \$2.25 \$2.75 \$3.50

Acme Nippers 50¢ 5%
 Cronk & Carrier Mfg. Co.:
 American Button 80%
 Improved Button 75¢ 10%
 Cronk's
 No. 80 Linemen's 50%
 Stub's Pattern 45%
 Combination and others 35%
 Heller's Farmers' Nippers, Pincers
 and Tools 40¢ 3/4 @ 40¢ 10%
 P. S. & W. Timmers' Cutting Nippers
 40%
 Wm. Schollhorn Co.:
 Bernard, 35%; Elm City, 35%;
 Paragon, 50%; Lodi, 55%
 Swedish Side, End and Diagonal Cutting
 Pliers 50%
 Utica Drop Forge & Tool Co.:
 Pliers and Nippers, all kinds 40%

Plumbs and Levels—

Chapin-Stephens Co.:
 Plumbs and Levels 30¢ @ 30¢ 10%
 Chapin's Imp. Brass Cor. 40¢ @ 40¢ 10%
 Pocket Levels 30¢ @ 30¢ 10%
 Extension Sights 30¢ @ 30¢ 10%
 Machinists' Levels 40¢ @ 40¢ 10%
 Diston's Plumbs and Levels 60¢ 10%
 Diston's Pocket Levels 60¢ 10%
 Stanley's Duplex 30%
 Woods' Extension 35%

Points, Glaziers—

Bulk and 1-lb. papers, 1 lb. 16¢
 1/2-lb. papers, 1 lb. 9¢ @ 10 1/2¢
 1/4-lb. papers, 1 lb. 9¢ @ 11¢

Police Goods—

Manufacturers' Lists 25¢ @ 25¢ 5%
 Tower's 25%

Polish—Metal, Etc—

Prestoline Liquid, No. 1 (1/4 pt.) 30¢
 30¢, \$3.00; No. 2 (1 qt.), \$9.00, 40%
 Prestoline Paste 40%

George William Hoffman:
 U. S. Metal Polish Paste, 3 oz.
 boxes, 50¢; doz., \$4.50.
 1 lb. boxes, 50¢; doz., \$1.25; 1 lb.
 boxes, 50¢; doz., \$2.25.
 U. S. Liquid, 8 oz. cans, 50¢ doz.,
 \$1.25.
 Barkeepers' Friend Metal Polish, 50¢
 doz., \$1.75.

Stove—

Black Eagle Benzine Paste, 5 lb. cans,
 50¢ 10¢
 Black Eagle, Liquid, 1/4 pt. cans,
 50¢ doz. 75¢
 Black Jack Paste, 5 lb. cans, 50¢ gr. \$9.00
 Black Kid Paste, 5 lb. cans, each, \$0.65
 Ladd's Black Beauty Liquid, per
 100 tins \$6.75
 Joseph Dixon's, 50 gr. \$5.75 10%
 Dixon's Plumbago 10%
 Fireside 50¢ gr. \$2.50
 Gem, 50 gr. \$4.50 10%
 Japanese 50¢ gr. \$3.50
 Jet Black 50¢ gr. \$3.50
 Peerless Iron Enamel, 10 oz. cans,
 50¢ doz. \$1.50

Poppers, Corn—

1 qt. Square doz. \$0.88; gro. \$8.75
 1 qt. Round doz. \$1.00; gro. \$10.00
 1/2 qt. Square doz. \$1.10; gro. \$11.00
 2 qt. Square doz. \$1.35; gro. \$13.50

Post Hole and Tree Augers and Diggers—

See also Diggers, Post Hole, &c.

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢;
 6 ft., 46¢; 6 1/2 ft., 48¢.
 Steel Hitching Posts, each \$1.30

Potato Parers—

See Parers, Potato.

Pots, Glue—

Enameled 35¢ 20%
 Tinned 30¢ 10%

Powder—

In Canisters:
 Duck, 1 lb. each 45¢
 Fine Sporting, 1 lb. each 75¢
 Rifle, 1/2 lb. each 15¢
 Rifle, 1 lb. each 25¢
 In Kegs:
 12 1/2-lb. kegs \$3.50
 25-lb. kegs \$4.50
 King's Semi-Smokeless:
 Keg (25 lb. bulk) \$6.50
 Half Keg (12 1/2 lb. bulk) \$3.50
 Quarter Keg (6 1/4 lb. bulk) \$1.90
 Case 24 (1 lb. cans bulk) \$3.50
 Half case (1 lb. cans bulk) \$4.50
 King's Smokeless:
 Keg (25 lb. bulk) \$12.00 \$15.00
 Half Keg (12 1/2 lb. bulk) 6.25 7.75
 Quarter Keg (6 1/4 lb. bulk) 3.25 4.00
 Case 24 (1 lb. cans bulk) 14.00 17.00
 Half case 12 (1 lb. c. bk.) 7.25 8.75

Presses—**Fruit and Jelly—**

Enterprise Mfg. Co. 20¢ 25%

Seal Presses—

Morrill's No. 1, 50 doz., \$20.00, 50%

Pruning Hooks and Shears

See Shears.

Pullers, Nail—

Cyclops 50%
 Miller's Falls, No. 3, 50 doz., \$12.00,
 35¢ 10%
 Morrill's No. 1, Nail Puller, 50 doz.,
 \$20.00, 50%
 Pearson No. 1, Cyclone Spike Puller,
 each \$30.00, 50%
 The Scranton Co. Case Lots:
 No. 2B (large) \$5.50
 No. 3B (small) \$5.00
 Smith & Hemenway Co.:
 Diamond B 70%
 Giant Puller, Utica and Davison 50%
 Staple Pullers, Utica and Davison 60%

Pulleys, Single Wheel—

Inch	1 1/2	1 3/4	2	3
Acning or Tackle, doz.	\$0.50	.45	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., 4 in., \$1.25; 5 in., \$1.55				
Inch doz.	2	1 3/4	1 1/2	1
Hot House, doz.	\$0.65	.85	1.20	
Inch doz.	1 1/2	1 3/4	2	3
Screw, doz.	\$0.16	.10	.25	
Inch doz.	1 1/2	1 3/4	2	3
Side, doz.	\$0.25	.40	.55	
Inch doz.	1 1/2	1 3/4	2	3

Sash Pulleys—

Common Frame; Square or
 Round End, per doz, 1 1/2 and
 2 in. 17¢ 20¢
 Auger Mortise, no Face Plate,
 per doz., 1 1/2 and 2 in. 20¢ 21¢
 Acme, No. 35, 1 1/2 in., 19¢; 2 in., 20¢
 Fox-All-Steel, Nos. 3 and 7, 2 in. 20¢
 Grand Rapids All Steel Noiseless, 50%
 Niagara, No. 25, 1 1/2 in., 19¢; 2
 in. 20¢ 4¢
 No. 26, Trov., 1 1/2 in., 14 1/4¢; 2 in., 16 1/4¢
 Star, No. 26, 1 1/2 in., 19¢; 2 in., 20 1/4¢
 Tackle Blocks—See Blocks.

Pumps—

Cistern 60%
 Pitcher Spout 75¢ 5¢ @ 75¢ 10%
 Wood Pumps, Tubing, &c. 45¢ 50%
 Barnes Dbl. Acting (low list) 40%
 Barnes Pitcher Spout 75¢ 5%
 Contractors' Rubber Diaphragm No.
 2 R. & L. Block Co. \$16.00
 Daisy Spray Pump doz. \$6.50

Flint & Walling's, Fast Mail Hand,
 (low list) 50%
 Flint & Walling's Fast Mail (low
 list) 50%
 Flint & Walling's Tight Top Pitcher,
 75¢ 10%
 National Specialty Mfg. Co. Measur-
 ing, Nos. 2, \$6.00; 3, \$3.50 30%
 Myers' Pumps (low list) 45%
 Myers' Power Pumps 45%
 Myers' Spray Pumps 45%

Pump Leathers—

Plunger and Lower Valve—Per
 gro.:
 Inch 2 2 1/2 2 3/4 2 5/8 3 1/4
 \$2.20 2.50 2.75 3.00
 Inch 3 3 1/2 3 3/4 3 5/8 4 1/4
 \$3.30 3.60 3.85 4.10 4.40

Plunger Cup Leathers—Per 100:
 Inch 2 2 1/2 2 3/4 2 5/8 3 1/4
 \$2.75 3.85 5.00 6.00

Punches—

Saddlers' or Drive, good doz. 50¢ 75¢
 Spring, single tube, good qual-
 ity \$1.75 @ 2.00
 Receiving (4 tubes) doz. \$3.50 @ 3.75
 Bemis & Call Co.'s Cast St'l Drive, 50%
 Morrill's Nos. 1AA, 1A, 1B, 1C,
 1D, 15.00, 50%
 Hercules, 1 die, each \$5.00, 50%
 Niagara Hollow Punches 40%
 Niagara Solid Punches 55¢ 10%
 Wm. Schollhorn Co.:
 Belt and Ticket, Bernard, 35%;
 Paragon, 50%; Lodi 55%
 Timmers' Hollow, P. S. & W. Co. 40%
 Timmers' Solid, P. S. & W. Co. 40%
 doz., \$1.44 40%

Rail—Barn Door, &c.—

Sliding Door, Painted Iron 2 1/2 @ 2 3/4¢
 Sliding Door, Wrought Brass,
 1 1/2 in., lb., 36¢ 30%
 Alth. Mfg. Co.: Reliable Hanger
 Track 50%
 Cronk's:
 Double Braced Steel Rail, 50 ft. 3 1/4¢
 O. N. T. Rail \$3.12
 Griffin's:
 xxx, 100 ft., 1 x 3-16 in., \$3.25;
 1 x 3-16 in., \$3.75.
 Hinged Hanger, 100 ft., 1 x 3-16
 in., \$3.50; 1 1/4 x 3-16 in., \$4.00.
 Lane's:
 Hinged Track, 100 ft. \$3.45
 O. N., 75¢ 100 ft., 1 in., \$3.00; 1 1/4
 in., \$3.45; 1 1/2 in., \$4.00.
 Standard, 1 1/4 in., 100 ft. \$4.00
 Lawrence Bros.:
 1 x 3-16 in., 100 ft., \$7.50; 1 1/4 x
 3-16 in., \$8.75 55¢ 7 1/2%
 McKinney's:
 Hinged Hanger Track, 50 ft., 1 1/4
 in., 60¢ 5¢
 1 x 3-16 Track 55¢ 7 1/2%
 Myers' Stayon Track 60¢ 5%
 Richards' Mfg. Co.:
 Common, 1 x 3-6 in., \$3.00; 1 1/4 x
 3-16, \$3.25; 1 1/2 x 3-16, \$3.50.
 Special Hinged Hanger Rail 60¢ 10%
 Lag Screw, 1 1/2 in., No. 65 50%
 Gauge Trolley Track, 50 ft., No. 31,
 9¢; No. 32, 14¢; No. 33, 20¢
 No. 50 60¢ 10%
 Nos. 61, \$3.00; 62, \$3.25; 63, \$3.50; 64,
 \$4.00; 45, \$3.25; 46, \$3.50; 49, No. 1,
 \$3.25; 49, No. 2, \$3.50.

Rakes—

NOTE.—Many goods are sold at net prices.

Fort Madison Red Head Lawn \$3.25
 Fort Madison Blue Head Lawn \$2.70
 Cronk's:
 Steel Garden: Champion, 75%;
 Ideal, 80%; Victor 80¢ 25%
 Queen City Lawn, 50 doz., 20 techs,
 \$2.55; 21 \$3.00 net
 Anticlog Lawn, 50 doz. \$4.00
 Malleable Garden 70¢ 10%
 Ideal Steel Garden, 50 doz. 12 teeth,
 \$15.00; 11, \$16.00; 16, \$18.00 80%
 Kohler's:
 Lawn Queen, 20-tooth 30 doz. \$3.15
 Lawn Queen, 24-tooth 30 doz. \$3.25
 Paragon, 20-tooth 30 doz. \$2.70
 Paragon, 24-tooth 30 doz. \$2.75
 Steel Garden, 14-tooth 30 doz. \$2.40
 Malleable Garden, 14-tooth, 30 doz.,
 \$2.00 @ 2.25

Rasps, Horse—

Diston's 75%
 Heller Bros. 70¢ 5¢ @ 70¢ 10% 5%
 Liveright Bros.' Gold Medal, 70¢ 10¢ 75%
 McCaffrey's American Standard 60¢ 10¢ 5%
 New Nicholson 70¢ 10¢ 75%
 See also Files.

Razors—

Liana Bo-ras-ic 60%
 Fox Razors, 50 doz., No. 42, \$20.00;
 No. 44, \$30.00; No. 45, Flatina 40%
 Red Devil 65%

Reels, Fishing—

Hendryx:
 M 6, Q 6, A 6, B 6, M 9 1/2, M 16,
 Q 16, A 16, B 16, 4008, Rubber,
 Populo, Nickeled Populo 20%
 Aluminum German Silr., Bronze 25%
 1240 N. 124 N. 314 7
 3204 N. 06 N. 6 R. M. G. 9 25%
 4 N. 6 PN 24 N. 9 PN 20%
 2204 P. 33 1/4%; 2204 PN. 33 1/4%; 0224 N.
 33 1/4%; 0224 N. 33 1/4%; 0224 PN.
 33 1/4%; 0224 N. 33 1/4%; 0224 PN.
 966 PN. 2204 N. 974 PN 25%
 5009 PN. 5009 N 20%
 Competitor, 102 P. 102 PN. 202 P.
 202 PN. 102 PR. 202 PR 20%
 304 P. 304 PN. 03031 P. 03031 PN. 33 1/4%

Registers—List July 1, 1903.

Japanned, Electroplated and
 Bronzed 66 2/3 %
 White Porcelain Enamel 60%
 Solid Brass or Bronze Metal,
 40¢ 10%

Revolvers—

Single Action 95¢ @ \$1.00
 Double Action, except 4 1/2 cal. \$2.00
 Double Action, 4 1/2 caliber \$2.00
 Automatic \$4.00
 Hammerless \$4.50

Riddles, Hardware Grade

16 in. per doz. \$2.50 @ \$2.75
 17 in. per doz. \$2.75 @ \$3.00
 18 in. per doz. \$3.00 @ \$3.25

Rings and Ringers—**Bull Rings—**

Steel 2 2 1/2 3 inch doz.
 Copper \$0.70 0.75 0.80 doz.
 Copper \$1.30 1.50 1.90 doz.

Hog Rings and Ringers—

Hill's Rings, gro. boxes \$4.25
 Hill's Ringers, Gray Iron doz. 50¢ 55¢
 Hill's Ringers, Malleable Iron doz. 70¢ 75¢
 Blair's Rings per gro. \$5.50
 Blair's Ringers, per doz. \$0.60 @ .65
 Brown's Rings, per gro. \$5.00 @ 5.50
 Brown's Ringers, per doz. \$0.60 @ .65

Rivets and Burrs—

Copper 33 1/3 % @ 25%
 Carriage, Coopers', Timmers, &c.:
 Black 70¢ 10%
 Metallic Tinned 70%

Bifurcated and Tubular—

Assorted in Boxes.
 Bifurcated, per doz. boxes, paste-
 board boxes, 23 @ 25¢; Tin boxes,
 29 @ 32¢.
 Tubular, per doz. boxes, 50 count,
 29 @ 32¢; 100 count, 51 @ 58¢.

Rollers—

Cronk's Stay, No. 50 \$1.00
 Cronk's Brinkerhoff No. 55, \$0.60;
 No. 56, \$0.75; No. 60 \$0.75
 Lane's Stay 40%
 Richards' Stay:
 Handy Adj. and Reversible No. 53, 75¢
 O. K. Adj. and Reversible No. 58, 50¢
 Lag Screw, Nos. 55 and 57 50%
 Underwriters, Nos. 59, 60 50%
 Favorite, No. 54 60%

Rope—

Manila, 7-16 in. diam. and larger:
 Pure 1 lb. 13¢ @ 13 1/2¢
 Sisal, 7-16 in. diam. and larger:
 Pure 1 lb. 9 1/4¢
 Sisal, 7-16 in. diam. and larger:
 No. 2 quality 1 lb. 7 1/4¢ @ 8¢
 Sisal, Hay, Hide and Bale
 Ropes, Medium and Coarse:
 Mixed 1 lb. 7 1/4¢ @ 8¢
 Pure 1 lb. 9 1/4¢
 Sisal, Tarred, Medium Lath
 Yarn, Coarse and Untarred:
 Mixed 1 lb. 7 1/4¢ @ 8¢
 Pure 1 lb. 8¢
 Cotton Rope:
 Best, 1/4-in. and larger 18 @ 20¢
 Medium, 1/4-in. and larger, 16 @ 17¢
 Common, 1/4-in. and larger 10¢
 In coils, 1/2¢ advance.
 Jute Rope:
 Thread, No. 1, 1/4-in. & up, 1 lb., 9¢
 Thread, No. 2, 1/4-in. & up, 1 lb., 8 1/2¢

Wire Rope—

Galvanized 37 1/2¢ @ 2 1/2%
 Plain 45¢ 2 1/2%

Ropes, Hammock—

Covert Mfg. Co.:
 Jute, 35%; Sisal 20%

Rules

Boxwood 60¢ @ 60¢ 10%
 Ivory 35¢ 10¢ @ 35¢ 10¢ 5%
 Chapin-Stephens Co.:
 Boxwood 60%
 Flexiford 40%
 Ivory 25¢ 25¢ 10%
 Miscellaneous 50¢ @ 50¢ 10%
 Stephens' Combination 55%
 Stationers' 50¢ @ 50¢ 10%
 Keuffel & Esser Co.:
 Folding, Wood 35¢ 10%
 Folding, Steel 33 1/4¢ 10%
 Infim's Steel 80¢ 10%
 Lufkin's Lumber 50¢ 10%
 Union Nut Co.:
 Boxwood 60¢ @ 60¢ 10%
 Ivory 35¢ 10¢ @ 35¢ 10% 10%

Sash Balances—

Saws—

Atkins' Circular	45%
Band	50@50&10%
Butcher Saws	50%
Cross Cuts	50%
One-Man Cross Cut	40%
Narrow Cross Cut	50%
Hand, Rip and Panel	35&5%
Miter Box and Compass	40%
Mulay, Mill and Drag	45%
Wood Saws	40&10%
Chapin-Stephens Co.	
Turning Saws and Frames	30@30&10%
Diamond Saw & Stamping Works	
Sterling Kitchen Saws	30&10&10%
Disston's	
Circular, Solid and Ins'ted Tooth	50%
Band, 2 to 18 in. wide	60%
Hand, 14 to 18 in.	50%
Crosscuts	45%
Narrow Crosscuts	50%
Mulay, Mill and Drag	50%
Framed Woodsaws	25%
Woodsaw Blades, Tinned	25%
Hand Saws, Nos. 12, 9, 9, 16, d100, D8, 120, 76, 77, 8	25%
Hand Saws, Nos. 7, 107, 107 1/2, 3, 1, 0, 00, Combination	30%
Compass, Key Hole, &c.	25%
Butcher Saws and Blades	30%
C. E. Jennings & Co.'s	
Back Saws	16%
Butcher Saws	25&7 1/2%
Compass and Key Hole Saws	33 1/2&7 1/2%
Framed Wood Saws	25&7 1/2%
Hand Saws	15%
Wood Saw Blades	33 1/2&7 1/2%
Millers Falls	
Butcher Saws	15&10%
Star Saw Blades	15&10%
Massachusetts Saw Works	
Victor Kitchen Saws	40&10&50%
Butcher Saws and Blades	35&40%
Peace & Richardson's Hand Saws	30%
Simonds'	
Circular Saws	45%
Crescent Ground Cross Cut Saws	30%
One-Man Cross Cuts	40&10%
Gang Mill, Mulay and Drag Saws	45%
Hand Saws	25@25&7 1/2%
Back Saws	25@25&7 1/2%
Butcher Saws	35@35&7 1/2%
Hand Saws	25@25&7 1/2%
Hand Saws, Bay State Brand	45%
Compass, Key Hole, &c.	25&40%
Food Saws	40&7 1/2%
Wheeler, Madden & Clemens Mfg. Co.'s Cross Cut Saws	50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A & A	25%
Disston's	
Concave Blades	25%
Keystone Blades	35%
Hack S & Frames	30%
Simonds' File Co.	35%
C. E. Jennings & Co.'s	
Hack Saw Frames, Nos. 175, 180	40&7 1/2%
Hack Saws, Nos. 175, 180, complete	40&7 1/2%
Goodell's Hack Saw Blades	40&10%
Griffin's Hack Saw Frames	35&5&10%
Griffin's Hack Saw Blades	35&5&10%
Star Hack Saws and Blades	15&10%
Sterling Hack Saw Blades	30&10&5%
Sterling Hack Saw Frames	30&10&5%
Sterling Power Hack Saw Machines, each, No. 1, \$25.00; No. 2, \$30.00	10%
Victor Hack Saw Blades	20%
Victor Hack Saw Frames	40%

Scroll—

Barnes, No. 7, \$15	25%
Barnes' Scroll Saw Blades	50%
Barnes' Velocipede Power Scroll Saws, without boring attachment	\$18
with boring attachment, \$30	20%
Lester, complete, \$10.00	15&10%
Rogers, complete, \$3.50 and \$4.00	15&10%

Scales—

Family, Turnbull's	50@50&10%
Counter	
Hatch, Platform, 1/2 oz. to 4 lbs.	doz. \$5.50
Two Platforms, 1/2 oz. to 5 lbs.	doz. \$16.00
Union Platform, Plain, \$1.70@1.90	
Union Platform, Stpd, \$1.85@2.15	
Chatillon's	
Eureka	25%
Favorite	40%
Crocker's Trip Scales	50%
The Standard Portables	40%
The Standard R. R. and Warehouse	50&10%

Scrapers—

Doz, 1 Handle	doz. \$2.00@2.25
Doz, 2 Handle	doz. \$3.50@3.60
Ship, Light, \$2.00; Heavy, \$4.50	
Chapin-Stephens Co., Box	30@30&10%
Richards Mfg. Co., Foot	60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in.	\$2.50@2.75
2 1/2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50	\$3.50@3.75
Hand, Wood	20@20&10%
Hand, Wood	70&10@70&10&10%
Chapin-Stephens Co., Hand	70@70&10&2 1/2%

Coach, Lag and Hand Rail—

Lag, Cone Point, list Oct. 1, '09	75&15%
Coach, Gimlet Point, list Oct. 1, '09	75&10%
Hand Rail, list Jan. 1, '11	70&10@75%

Jack Screws—

Standard List	70&10@75%
Millers Falls	50&10&10%
Swett Iron Works	70@75%

Machine—

List Jan. 1, '08:	
Flat or Round Head, Iron, Brass or Bronze	50@50&10%
Flat Head, Iron, Brass or Bronze	40@40&10%

Set and Cap—

Set (Iron)	75&10&7 1/2%
Set (Steel), net advance over Iron	25%
Sq. Hd. Cap	70&10&7 1/2%
Hex. Hd. Cap	70&10&7 1/2%
Rd. Hd. Cap	50&7 1/2%
Fillister Hd. Cap	60&7 1/2%

Wood—

List July 23, 1905.

Flat Head, Iron	87 1/2&5@
Round Head, Iron	85&5@
Flat Head, Brass	80&5@
Round Head, Brass	77 1/2&5@
Flat Head, Bronze	75&5@
Round Head, Bronze	72 1/2&5@
Drive Screws	87 1/2&5@

Scroll Saws—

See Saws, Scroll.

Scythes—

Per doz.

Grass, No. 1, Plain	\$6.25@6.75
Clipper, Bronzed Webb	\$6.50@7.00
No. 3 Clipper, Pol'd Webb	\$6.75@7.25
No. 6 Clipper and Solid Steel	\$7.00@7.50
Bush, Weed and Bramble, No. 2	\$6.50@7.00
Grain, No. 1	\$8.25@8.75
Bronzed Webb, No. 1	\$8.50@9.00
No. 3 and 4 Clipper, Grain	\$8.75@9.25
Solid Steel, No. 6	\$9.25@9.75

Seeders, Raisin—

Euterprase	25@30%
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Sets—Awl and Tool—

Fray's Adj. Tool Handles, No. 1, \$12; 2, \$18; 3, \$12; 4, \$9; 5, \$7	50%
Millers Falls Adj. Tool Handles, No. 1, \$12; No. 4, \$12; No. 5, \$18	20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel	doz sets \$9.00
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Sets, Nail—

Octagon	gro. \$3.50@3.75
Buck Bros	27 1/2%
Cannon's Diamond Point	gro. \$12
Mayhew's	gro. \$9.00
Snell's Corrugated, Cup Pt.	40&10%
Snell's Knurled, Cup Pt.	40&10%
Victor Knurled Cup Pt.	gro. \$7.50

Rivet—

Regular list	75@75&10%
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Saw—

Atkins'	
Criterion	40%
Adjustable	40%
Disston's Star, Monarch and Triumph	30%
Morrill's No. 1	\$15.00
No. 3 and 4, Cross Cut	\$30.00
No. 5, Mill	\$30.00
No. 10, 11, 95	\$15.00
No. 1 Old Style	\$10.00
Special	\$16.25
Giant Royal Cross Cut	doz. \$8.00
Royal, Hand	doz. \$4.50
Taintor Positive	doz. \$6.75

Shaving—

Fox Shaving Sets, No. 30	doz. net \$24.00
Smith & Hemenway Co.'s	75%

Sharpeners, Knife—

Pike Mfg. Co.	
East Cut Pocket Knife Hones	doz. \$1.50
Mounted Kitchen Sand Stone	doz. \$1.50
Natural Grit Carving Knife	doz. \$3.00
Hones, doz.	\$3.00
Quick Cut Emery Carving Knife Hones, doz.	\$1.50
Quick Edge Pocket Knife Hones, doz.	\$2.50

Skate—

Smith & Hemenway Co., Eureka	50%
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Shaves, Knife—

Iron	doz. \$1.10@1.25
Wood	doz. \$1.75@2.25
Bailey's (Stanley R. & L. Co.)	45%
Chapin-Stephens Co.	30@30&10%
Goodell's, doz.	\$9.00

Shears—

Cast Iron	7 8 9 in.
Best	\$16.00 18.00 20.00 gro.
Good	\$13.00 15.00 17.00 gro.
Cheap	\$5.00 6.00 7.00 gro.
Straight Trimmers, &c.	
Best quality Jap.	70@70&10%
Best quality, Nickel	60@60&10%
Tailors' Shears	40@40&10%
Acme Cast Shears	40@40&5%
Heinisch's Tailor's Shears	10%
Wilkinson Shear & Cutlery Co.	30&10&5%
Grass	50&10%
Horse or Mule	50&10%

Tinners' Snips—

Steel Blades	20&5@20&10%
Steel Laid Blades	40&10@50%
Forged Handles, Steel Blades, Berlin	50%
Heinisch's Snips	40%
Jennings & Griffin Mfg. Co.'s 6 1/2 to 10 in.	35&10%
Niagara Snips	40%
P. S. & W. Forged Handles	25%
W. R. W.	40&10%

Pruning Shears—

Cronk's Hand Shears	33 1/2%
Cronk's Wood Handle Shears	33 1/2%
Disston's Combined Pruning Hook and Saw, doz. \$18.00	25%
Disston's Pruning Hook only, doz. \$12.00	25%
John T. Henry Mfg. Co.	
Pruning Shears, all grades	40%
P. S. & W. Co.	40&10%
Columbian Cutlery Co.	
Hedge, Wilcut Brand	60&10%
Lawn and Border, Wilcut Brand	60&10%

Sheaves—Sliding Door—

Reading	40%
R. & E. list	10%

Sliding Shutter—

Reading list	40%
R. & E. list	10%

Shells—Shells, Empty—

Brass Shells, Empty:	
Climax, 10 and 12 gauge	65&10%
Club, Rival, 65&5%; First Quality	60&5%

Paper Shells, Empty:

New Rapid, 10, 12, 16 and 20 gauge	25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Leader grade	25&5%
Union, League, 12 and 12 gauge	25%
Rival Grade	25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge	20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade	20%
Expert, 10, 12, 16 and 20 gauge	33 1/2&5%

Shells, Loaded—

Loaded with Black Powder	40%
Loaded with Smokeless Powder, medium grade	40&5%
Loaded with Smokeless Powder, high grade	40&10&10%
Union Metallic Cartridge Co.	
New Club, Black Powders	40%
Nitro Club, Smokeless Powders	40&5%
Arrow, Smokeless Powders	40&10&10%
Winchester:	
Smokeless Repeater Grade	40&5%
Smokeless Leader Grade	40&10&10%
Black Powder	40%

Shingles, Metal—Per Sq.

Edwards Mfg. Co.:	
14 x 20	Painted, \$1.25; Galv. \$6.00
10 x 14	4.50 6.25
7 x 10	4.75 6.50
Wheeling Corrugating Co.:	
Dixie, 14 x 20 in.	\$4.25 \$5.50
Dixie, 10 x 14 in.	4.50 6.00
Dixie, 7 x 10 in.	5.00 6.75

Shoes, Horse, Mule, &c.—

F. O. B. Pittsburgh:	
Iron	per keg \$4.10
Steel	per keg \$3.85
Burden's, all sizes	per keg \$3.90

Shot—

Drop, up to B	25-lb. bag, \$1.95
Drop, B and larger	2.20
Buck	2.20
Chilled	2.20
Dust	2.40

Shovels and Spades—

Association List, Nov. 15, 1902	40%
Avery Stamping Co.	40%

Snow Shovels—

Long Handle	\$3.25@3.50
Wood and Mail, D. Handle	\$3.75@4.00

Sieves and Sifters—

Hunter's Imitation	gro. \$9.50@10.00
Hunter's Genuine	per gro. \$12.00@12.50

Sieves, Seamless Metallic

Per dozen:	
Mesh	14 16 18 20
Iron Wire	\$1.05 1.05 1.10 1.20
Tinned Wire	\$1.15 1.15 1.20 1.30

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch	
Mesh 18, Nested	doz. \$0.90@0.95
Mesh 20, Nested	doz. \$1.00@1.05
Mesh 24, Nested	doz. \$1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:	
12 x 12 to 22 x 36 in.	60%
20 x 40 to 24 x 50 in.	50%
24 x 60 to 24 x 120 in.	30%

Barnes' low list:

Up to and including 20 x 36 in.	50%
20 x 40 to 24 x 50 in.	45%

NOTE—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron	70@75&10%
Steel	40@40&10%

Slates, School—

Factory Shipments.	
"D" Slates	50@50&10%
Eureka, Unexcelled Noiseless	60&5 tens
Victor A, Noiseless	60&4 tens 65%

Slaw Cutters—See Cutters.**Snaps, Harness—**

German	40@40&10%
Covert Mfg. Co.	
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%	
High Grade, 40%; Trojan	40%
Jockey	25%

Snaths—

Scythe	50%
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Snips, Tinners—See Shears.**Spoons and Forks—****Silver Plated—**

Good Quality	50&10@60&5%
Cheap	60@60&10%
International Silver Co.:	
1847 Rogers Bros., 40&10%; Rogers & Hamilton	50&10%
Rogers & Bro., William Rogers	50&10%
Eagle Brand	50&10%
Anchor, Rogers Brand	60%
Wm. Rogers & Son	60&10%

Miscellaneous

German Silver	60@60&5%
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Tinned Iron—

Teas	per gro. 50@55¢
Tables	per gro. \$0.90@1.00

Springs—Door—

Bardsley's Spring and Check	
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Scythe Stones—

Like Mfg. Co., 1901 list:	
Black Diamond S. S. gro.	\$12.00
Lamotte S. S. gro.	\$11.00
White Mountain S. S. gro.	\$9.00
Green Mountain S. S. gro.	\$8.00
Extra Indian Pond S. S. gro.	\$7.50
No. 1 Indian Pond S. S. gro.	\$7.00
No. 2 Indian Pond S. S. gro.	\$4.50
Leader Red End S. S. gro.	\$4.50
Quick Cut Emery gro.	\$10.00
Pure Corundum gro.	\$18.00
Crescent gro.	\$7.00
Emery Scythe Rifles, 2 Coat.	\$8
Emery Scythe Rifles, 3 Coat.	\$12
Emery Scythe Rifles, 4 Coat.	\$12
Balance of 1904 list 33 1/2%	
Electro (Artificial) gro.	\$12.00
Lightning (Artificial) gro.	\$18.00

Stoppers, Bottle—

Victor Bottle Stoppers.....gro. \$9.00

Stops—Bench—

Millers Falls.....	15¢@10%
Morrill's, doz. No. 1.....	\$10.00@50%
Morrill's, No. 2.....	\$12.50@50%

Door—

Chapin-Stephens Co.....50¢@50¢@10%

Plane—

Chapin-Stephens Co.....20%

Straps—Box—

Cary's Universal, case lots.....20¢@10¢@10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60¢@60¢@10%

Socketdoz. \$1.60

Excelsior Stretcher and Tack Hammer Combined, doz. \$6.00.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25¢@25¢@7 1/2%

National Specialty Co., list Jan. 1, 1902.....30¢@5%

P., S. & W. Co.....40¢@10¢@5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: doz.

Superba, Crotch Mahogany.....\$36.00

Triumph, Fancy Veneers.....\$33.00

Parlor Queen, Fig. Rosewood.....\$30.00

Elite, Hungarian Ash.....\$29.00

Am. Queen, Fig. Mahogany.....\$27.00

Ideal, Bird's-Eye Maple.....\$25.00

Grand Rapids, Nickel.....\$21.00

Japan.....\$22.00

Standard, Nickel.....\$22.00

Crown Jewel, Nickel.....\$21.00

Crystal, Glass Top.....\$36.00

Grand, 17 in. wide.....\$36.00

Club, 24 in. wide.....\$54.00

Hall, 28 in. wide.....\$60.00

NOTE.—Rebates: 50¢ per dozen on three dozen lots; \$1 per dozen on five-dozen lots; \$2 per dozen on ten-dozen lots; \$3.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks.....90¢@25%

American Cut Tacks.....90¢@25%

Succede's Cut Tacks.....90¢@25%

Succede's Upholsterers.....90¢@35%

Gimp Tacks.....90¢@35%

Lace Tacks.....90¢@35%

Trimmers' Tacks.....90¢@25%

Looking Glass Tacks.....65%

Bill Posters' and Railroad Tacks, 90¢@40%

Hungarian Nails.....80¢@10%

Finishing Nails.....70%

Trunk and Clout Nails.....80%

NOTE.—The above prices are for Standard Weights.

Miscellaneous—

Double Pointed Tacks.....90¢@4 or 5 tons

See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.: Oil

Gal. Gasoline.....\$3.00

20.....\$2.75

60.....\$3.50

120.....\$5.00

Tapes, Measuring—

American Asses' Skin.....50¢@—

Patent Leather.....25¢@30¢@5%

Steel.....35¢@35%

Chesterman's.....25¢@25¢@5%

Keuffel & Esser Co.: Favorite, Ass Skin.....40¢@10¢@50%

Favorite, Duck and Leather.....25¢@25¢@10%

Metallic and Steel, lower list, 35¢@55¢; Pocket, 35¢@55¢

Lufkin's: Asses' Skin.....40¢@10¢@50%

Metallic.....30¢@30¢@5%

Patent Bend, Leather.....25¢@25¢@10%

Pocket.....40¢@40¢@5%

Steel.....35¢@35%

Wiebusch & Hilger: Chesterman's Metallic, No. M.L. etc.....25%

Chesterman's Steel, No. 1038L.....35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, 1/4-inch and larger, per 100 lbs. \$2.75@3.00

Thermometers—

Tin Case.....80¢@10¢@80¢@10¢@5%

Ties, Bale—Steel Wire—

Single Loop.....80¢@10¢@5%

Monitor, Cross Head, etc. 70¢@2 1/2%

Tinners' Shears, &c.—

See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See Benders and Upsetters, Tire.

Tools—Coopers'—

L. & I. J. White.....20¢@20¢@5%

Haying—

Myers' Hay Tools.....45%

Miniature—

Smith & Hemenway Co.'s, Davidson, doz. Nickel Plated. \$1.50;

Gold Plated.....\$2.00

Saw—

Atkins' Cross Cut Saw Tools.....35¢@5%

Simonds' Improved.....33 1/2%

Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See Lifters, Transom.

Traps—Fly—

Balloon, Globe or Acme, doz. \$1.15@1.25; gro. \$11.50@12.00

Harper, Champion or Paragon, doz. \$1.25@1.40; gro. \$13.00@13.50

Game—

Imitation Onocida.....70¢@10%

Newhouse.....45¢@5%

Hawley & Norton.....65%

Victor.....70¢@18%

Onocida Community Jump.....60%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢

Mouse, Round or Square Wire, doz. 85¢@90¢

Marty French Rat and Mouse Traps (Genuine):

No. 1, Rat, doz., \$13.25; case of 24.....\$11.50 doz.

No. 3, Rat, doz., \$6.50; case of 50.....\$5.75 doz.

No. 3 1/2, Rat, doz., \$5.25; case of 75.....\$4.70 doz.

No. 4, Mouse, doz., \$3.85; case of 150.....\$3.00 doz.

No. 5, Mouse, doz., \$3.00; case of 150.....\$2.25 doz.

Trowels—

Diston Brick and Pointing.....25%

Diston Plastering.....20%

Diston "Standard Brand" and Garden Trowels.....30%

Kohler's Steel Garden Trowels, doz., 5 in., \$4.80; 6 in., \$6.00.

Never-Break Steel Garden Trowels, doz. gro. \$6.00

Woodrough & McParlin, Plastering.....25%

Trucks, Warehouse, &c.—

B. & L. Block Co.: New York Pattern.....50¢@10%

Western Pattern.....60¢@10%

Handy Trucks.....doz. \$16.00

Grocery.....doz. \$15.00

McKinney Trucks.....each, net \$10.00

Model Stove Trucks.....doz. \$18.50

Tubs, Wash—

Mfg's list, price per gross.

No. 0 1 2 3

Galvanized. \$67 \$79 \$89 \$99 10%

Twine, Miscellaneous—

Flax Twine:

No. 9, 1/4 and 1/2-lb. Balls, 23¢@25¢

No. 12, 1/4 and 1/2-lb. Balls, 21¢@22¢

No. 18, 1/4 and 1/2-lb. Balls, 18¢@20¢

No. 24, 1/4 and 1/2-lb. Balls, 17¢@19¢

No. 36, 1/4 and 1/2-lb. Balls, 16¢@18¢

Chalk Line, Cotton 1/2-lb. Balls.....26¢@31¢

Cotton Mops, 6, 9, 12 and 15 lb. to doz.....11¢@19¢

Cotton Wrapping, 5 Balls to lb. according to quality.....15¢@23¢

American 2-Ply Hemp, 1/4 and 1/2-lb. Balls.....14¢@15¢

American 3-Ply Hemp, 1-lb. Balls.....15¢@16¢

India 2-Ply Hemp, 1/4 and 1/2-lb. Balls (Spring Twine).....10¢@11¢

India 3-Ply Hemp, 1-lb. Balls.....10¢@11¢

India 3-Ply Hemp, 1 1/2-lb. Balls.....10¢@11¢

2, 3, 4 and 5-Ply Jute, 2 1/2-lb. Balls.....13¢@14¢

Mason Line, Lines, 1/2-lb. Bls. 47¢

No. 26 1/2 Mattress, 1/4 and 1/2-lb. Balls, according to quality.....30¢@60¢

Wool, 3 to 6 ply....B 9¢; A 10¢

Vises—

Solid Box.....50¢@50¢@10%

Parallel—

Athol Machine Co.: Simpson's Adjustable.....40%

Standard.....49%

Amateur.....25%

Columbian Bldg. Co.....40%

Emmert Universal: Pattern Makers' No. 1, \$15.00; No. 2, \$12.50.

Machinist and Tool Makers' No. 4A, \$12.50; No. 6A, \$10.00; No. 10A, \$22.50.

Tiger Machinists.....50%

Fisher & Norris Double Screw, net, each, Nos. 2, \$10.50; 3, \$16.00; 4, \$20.50; 5, \$27.00.

Fulton Mach. & Vise Co.: Reed, Swivel.....25%

Star, Solid Jaw.....40%

Hollands: Machinists'.....40¢@45%

Keystone.....65¢@70%

Lewis Tool Co.: Adjustable Jaw.....30%

Monarch, 50%; Solid Jaw.....50%

Massey Vise Co.: Clincher.....40%

Perfect, 15%; Lightning Grip.....15%

Merrill's Vise Co.: Miers Oval Slide Pattern, 60¢@10%

Parker's: Victor, 20¢@25%; Regulars.....20¢@25%

Vulcan's.....40¢@45%

Combination Pipe.....55¢@60%

Prentiss.....20¢@25%

Rock Island.....25%

Sneidker's X. L.....33 1/2%

Stephens'.....33 1/2%

Saw Filers—

Diston's 1 1/2 Clamp and Guide, doz. \$24.00; 30% Clamps.....30%

Perfection Saw Clamps, doz. \$4.50

Reading.....60%

Wood Workers—

Fulton Mach. & Vise Co.: Reed.....25%

Star.....40%

Massey's Vise Co.: Lightning Grip, 15%; Perfect.....15%

Wyman & Gordon's Quick Action, 6 in., \$6.00; 9 in., \$7.00; 14 in., \$8.00.

Miscellaneous—

Holland's Combination Pipe, 60¢@60¢@5%

Massey's Quick Action Pipe.....40%

Parker's Combination Pipe: 87 Series, 60%; 187 Series, 60¢@5%; No. 870, 40%.

Rock Island Pipe.....25%

Wads—Price per M.

B. E., 11 up.....60¢

B. E., 9 and 10.....70¢

B. E., 8.....80¢

B. E., 7.....80¢

P. E., 11 up.....1.00

P. E., 9 and 10.....1.25

P. E., 8.....1.50

P. E., 7.....1.50

Ely's B. E., 11 and larger, \$1.70@1.75

Ely's P. E., 12 to 20.....\$3.00@3.25

Ware, Hollow—

Cast Iron, Hollow—

Store Hollow Ware:

Enameled.....45¢@10%

Ground.....50¢@5%

Plain or Unground.....60%

Country Hollow Ware, per 100 lbs.....\$3.00

White Enameled Ware:

Mastin Kettles.....65¢@10%

Covered Ware:

Tinned and Turned.....35¢@10%

Enameled.....45¢@10%

See also Pots, Gluc.

Enameled—

Agate Nickel Steel Ware.....33 1/2%

Iron Clad Ware.....70¢@10%

Lava and Volcanic, Enameled.....40¢@10%

Tea Kettles—

Galvanized Tea Kettles:

Each.....45¢ 50¢ 55¢ 65¢

Steel Hollow Ware—

Avery Spiders and Griddles.....65¢@55¢@5%

Avery Kettles.....60%

Porcelain.....50¢@50¢@10%

Never Break Spiders and Griddles.....55¢@5%

Never Break Kettles.....60%

Solid Steel Spiders and Griddles.....65¢@5%

